ADVANCED
COLLABORATIVE SOLUTIONS

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Putting it All Together

As we continue to place an emphasis on improved practice, we want to define instructional strategies so teacher teams could refer to this as a basis for justification and alignment in making their choices. *Instructional strategies are teacher actions designed to raise student levels of thinking and learning around specific learning targets. They are purposeful methods of instruction that help create vibrant, independent students who can assess their learning.*

With the definition in place, we encourage teams to improve their methods and classroom environments and put a structured approach to addressing all student needs.

Timing is Everything: Selecting Strategies for Optimal Learning

Some instructional strategies, like success criteria, are unanimously touted as impactful while others get a bad rap. This leaves us to wonder: Out of the hundreds of strategies to choose from, which ones produce optimal learning?

What we don't often talk about in the larger scheme of learning is the fact that when a strategy is introduced can have a significant bearing on how effective that strategy is in increasing student learning and, by proxy, student achievement. In a 2016 study, John Hattie and Gregory Donoghue introduced a model of learning to explore how various strategies aimed at increasing student achievement "can most effectively enhance performance when they are matched to the requirements of the task." That is to say, when a strategy is introduced during the phase of the learning process in which it can best be absorbed by students.

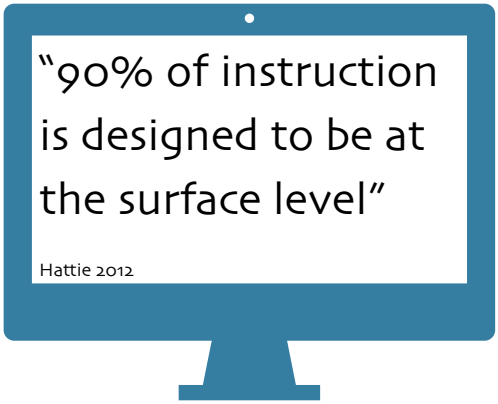
Surface, Deep, and Transfer Learning

Within Hattie and Donoghue's model of learning, there are three main phases: Surface, deep, and transfer. While these learning phases can sometimes overlap in practice (for example, surface and deep learning can be accomplished at the same time), it's beneficial to think of them as distinct phases when planning which learning strategies are to be introduced at what point during a learning progression or unit of instruction. Teams who consider and discuss the phases of learning when collaboratively planning and implementing instruction are best equipped to select the strategies that have the highest probability of increasing student growth and achievement.

Surface Leaning = Knowledge Building

Surface learning is factual learning that is a prerequisite for deeper learning. To best describe surface learning, it's helpful to compare it to deep learning. In Achievement Teams, we stress the use of learning progressions that contain prerequisite concepts and skills (surface) that lead to more advanced concepts and skills (deep). Therefore, surface learning strategies focus on recall or procedural information, such as explaining, naming, note-taking and restating. Think of a situation where students are required to learn something new, like playing a musical instrument. The initial music lessons are focused on reading music, playing scales, and learning rhythms - all examples of surface learning. When students can eventually play entire passages and perform for others, they have achieved deep learning. *"Surface learning is critical because it provides a foundation on which to build as students are asked to think more deeply."* Hattie, Fisher and Frey (Visible Learning for Mathematics, 2017)

Once surface learning is acquired, students need to be able to store it in a way that allows it to be retrieved at will. One strategy that is helpful to consolidate surface learning is outlining, in which a student organizes thoughts or information related to a project or writing assignment. For example, using an outline at the beginning of the writing process helps to clarify ideas in a structured hierarchy while demonstrating to the teacher the thinking process behind a student's writing.



Deep Learning = Create Meaning

Deep learning is a product of surface learning. It occurs when students can revisit and recall surface-level knowledge and use it to obtain deeper learning. In other words, deep learning connects surface learning to help students progress to higher levels of achievement. As such, deep learning can be considered an extension of a student's prior knowledge. As Hattie explains, students who "know what to do when they don't know what to do'' have achieved deep learning.

When students have sufficiently acquired surface and deep learning, they need strategies to help them consolidate this knowledge so they can be more strategic in their approach to learning. A strategy used across content areas to bolster students' understanding of a given topic is reciprocal teaching. With this strategy, teachers and students share in the teaching

and discussion through a structured dialogue. Reciprocal teaching actively engages students in the learning process and teaches them to ask meaningful questions. *"We define deep learning as a period when students consolidate their understanding and apply and extend some surface learning knowledge to support deeper conceptual understanding."* Hattie, Fisher and Frey (Visible Learning for Mathematics, 2017)

Transfer Learning = Apply Strategies and Understanding

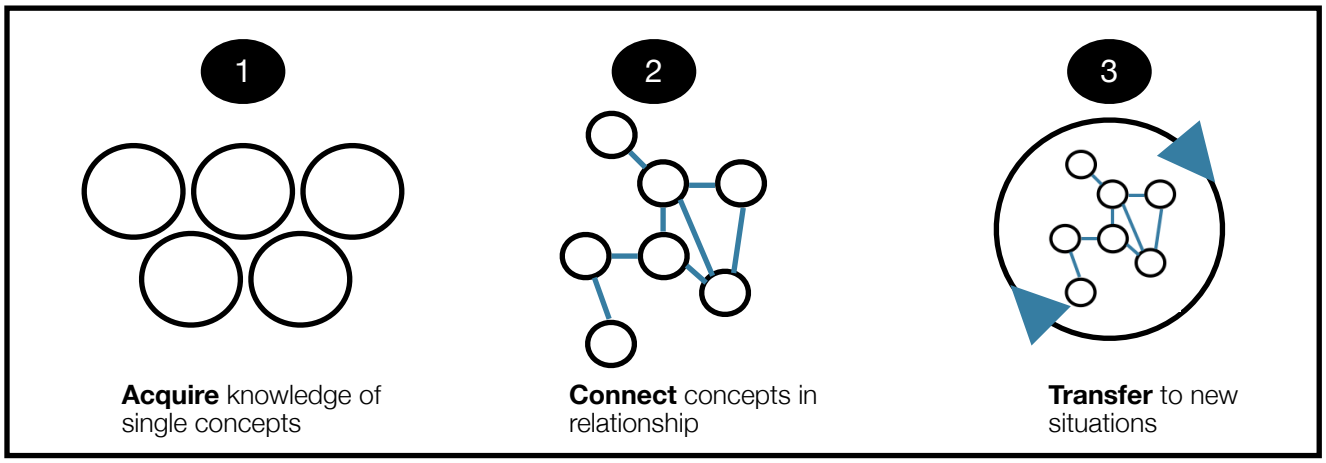
It takes skill to transfer knowledge from one situation to the next. The transfer phase of learning is often the most elusive because transferring understanding to multiple situations is a dynamic process that requires learners to actively evaluate strategies and to adapt to situational information. As a result, finding the time to select strategies and design learning experiences to promote transfer learning can be frustrating.

One way that the transfer of learning can be evidenced is by asking students to identify similarities and differences. This strategy helps learners make connections to prior knowledge, compare information, and categorize concepts. Using compare and contrast strategies, such as metaphors and analogies, help students to think critically and process new information. When students understand contextual similarities and differences, they learn how to consistently select the appropriate strategy for the situation at hand.

"Transfer learning [is] the point at which students take their consolidated knowledge and skills and apply what they know to new scenarios and different contexts. It is also a time when students are able to think metacognitively, reflecting on their own learning and understanding." - Hattie, Fisher and Frey (Visible Learning for Mathematics, 2017)

All transfer is achieved through comparing what we already understand to a new situation.

ACT: The Learning Transfer Model - Stern, Ferraro, Duncan, Aleo (Learning that Transfers, 2021)



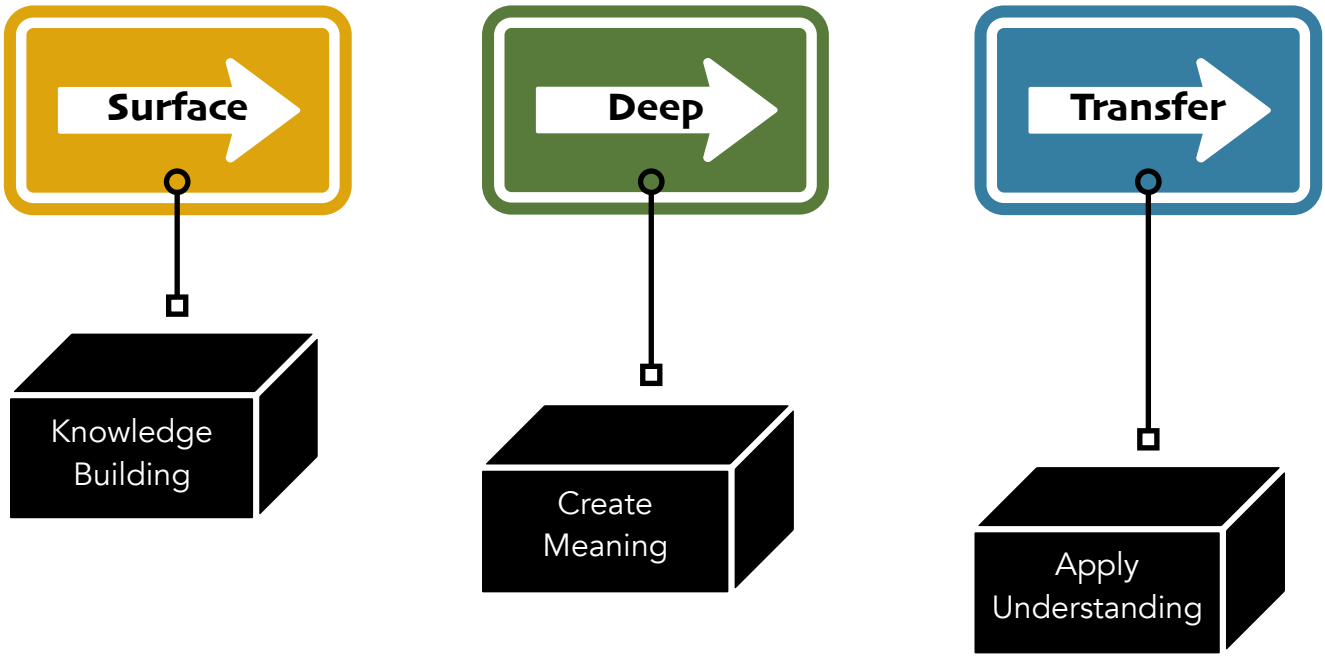
Activity

We believe an understanding of these three phases can add tremendous value as teams discuss, search, and apply learning strategies. Even more important is a constant reminder of the types of instruction students currently receive. If Hattie believes that 90% of classroom instruction is surface, then how can educators be better consumers of strategy selection that align with deep and transfer? How do teachers currently select instructional strategies as they examine and analyze assessment results?

Directions

We've listed several strategies aligned with the phases of learning. Your task is to read each strategy and determine at what phase it best represents. After studying the explanations, share a summary of that strategy with a colleague and your reason why you believe it is surface, deep, or transfer.

Hint: if clarifying the differences between surface, deep, and transfer learning seem confusing, re-read our definitions and try to eliminate the learning phase which least represents the strategy.



Strategy	Explanation	Surface? Deep? Transfer?
1. Organizing and Transforming Notes	Transforming involves organizing information, but in this process, students rearrange information to show interrelationships between ideas. These interrelationships can include making comparisons, looking at cause and effect relationships, or identifying trends and patterns. The use of visuals while transforming notes can help the learner retain information more effectively. Examples of ways to transform information are: using Venn diagrams, concept maps, tables, graphs, timelines, etc.	
2. Cooperative Learning	Cooperative learning is a teaching strategy in which small groups of learners work together to accomplish a shared goal. This strategy allows students with different levels of ability to use their strengths to maximize learning for themselves and their group as a whole. Learners work together using higher-order thinking skills to solve complex problems. Team members use their skills to research, reflect, and apply prior knowledge to the given group assignment. Cooperative grouping creates a cohesive environment where members feel that they are a valuable part of their team, increasing motivation and achievement to accomplish a common goal. Studies have shown that if implemented correctly, the results of cooperative learning are improved attendance, behavior, achievement, and self-confidence in the classroom.	
3. Outlining	Outlining is a strategy to organize thoughts or information related to a project or writing assignment. Using an outline at the beginning of the writing process helps to clarify thoughts and ideas in a structured hierarchy to begin the writing process. Outlines demonstrate the thinking process behind a student's writing and provide teachers with a map to help guide for further instruction. Students can use heading, subheadings, bulleted lists, and graphical techniques to separate main ideas from supporting details.	

Strategy	Explanation	Surface? Deep? Transfer?
4. Spaced versus Mass Practice	Mass Practice represents longer instructional sessions instead of frequent review. Mass Practice is a continuous task, usually completed in one lesson. Spaced Practice permits students to retain information longer when it is presented in smaller chunks over time, including rest time between intervals. Spaced Practice contributes to long term memory and learning retention.	
5. Summarizing	Summarizing teaches students to read a large selection of text and capture the most important ideas while excluding irrelevant or repetitive information. Summarization is an effective tool for improving students' memory and comprehension for reading and is effective for almost all content areas. This strategy must be explicitly taught and used used frequently in order for students to become skilled in using this strategy.	
6. Vocabulary Programs	Vocabulary is the knowledge of words and their meanings. Having a rich vocabulary supports reading development and increases comprehension. Studies show a link between having a low vocabulary understanding with low reading comprehension scores, while students with a rich vocabulary have higher reading comprehension scores. The National Reading Panel (2000) recommended using a variety of indirect (incidental) and direct (intentional) methods of vocabulary instruction. Indirect vocabulary development comes from being exposed to rich conversations and vocabulary at home and school orally and in print. Students need targeted instruction on techniques for direct vocabulary development. Some research-based vocabulary-learning strategies include: the use of context clues, defining words in context, sketching words to show meaning, analyzing word parts, and semantic mapping.	

Strategy	Explanation	Surface? Deep? Transfer?
7. Metacognitive Strategies	Metacognition is defined as awareness and understanding of one's own thought processes. It means "thinking about one's thinking" after learning has taken place. In order for students to be effective learners they must be become aware of how they acquired knowledge, performed tasks or solved problems (P. Gagné 2009). When students are taught how to self-assess they become more confident and willing to take on new challenges. Students should continue to ask themselves questions as they work through a learning task: What do I know? How do I know it? Could I explain this to someone else? It is also important to build in reflection questions after the learning has occurred. These questions might include: What did I learn? How has my thinking changed? What do I need to learn next? The strategy of metacognition can be applied across content areas to create self-directed learners.	
8. Class Discussion	During quality formal class discussions, the teacher designs a scenario for students to discuss a specific topic. The teacher becomes the facilitator with prepared, purposeful questions and invites students to speak, ask questions, and justify their thinking. Examples of ways to implement class discussions might include think-pair-share, fishbowl, Socratic seminar, round table. It is helpful to provide students with conversation prompts and set ground rules before beginning this strategy.	
9. Peer Tutoring	Peer tutoring is a teaching strategy that pairs students together to work on various skills, such as academic content, critical thinking, problem-solving, and social or emotional behaviors. This strategy has been shown to improve student relationships and academic achievement. Peer tutoring benefits the tutor because they learn to become leaders, improve communication skills, and gain a deeper understanding of content as they teach their peers. The tutee benefits from the relationship because they gain confidence, form peer relationships, and improve communication.	

Strategy	Explanation	Surface? Deep? Transfer?
10. Problem-Solving Teaching	Problem-solving teaching is a teaching strategy that presents students with problems requiring investigation, critical-thinking, and collaboration to solve real-world problems within the context of a subject area. By providing students with high-interest relevant topics, they will be more motivated and develop the skills for adapting to our ever-changing world. Students should not know that problem in advance but apply prior knowledge and skills to achieve the goal. Planning is key to success. Teachers should plan and teach the content skills needed for the lesson ahead of the investigation, model problem-solving strategies, use success criteria, and give plenty of time for the task.	
11. Identifying Underlying Similarities and Differences	The strategy of identifying similarities and differences is a key to help learners make connections to prior knowledge, compare information, and categorize concepts. Identifying similarities and differences helps learners gain insight, draw inferences, make generalizations, and develop or refine schemas (Holyoak, 2005). There are a variety of ways to develop this strategy in the classroom. Using compare and contrast strategies, such as, categorizing objects and ideas to look for connections, using metaphors to highlight similarities and analogies for differences help students to think critically and process new information. Cognitive research shows that educational programs should challenge students to link, connect, and integrate ideas (Bransford, Brown, & Cocking, 1999).	
12. Imagery	Imagery is a strategy helps learners construct mental images as they read or hear information. To help understand new concepts, teachers may use visual images to help students make connections and get a clear picture of the idea. Good readers must learn to construct mental pictures as they read. Through guided visualization, students learn how to connect prior knowledge to the author's writing.	

Strategy	Explanation	Surface? Deep? Transfer?
13. Concept Mapping	Concept maps are visual organizations and representations of knowledge and information. They are powerful because they help students chunk information based on meaningful connections. Concept maps allow learners to uncover the big picture idea by starting with higher-level concepts and connecting the details. The visual elements are a powerful way to help the learner see the relationships between different topics, analyze information, and make comparisons. Concept maps are more meaningful when the learner creates them. Some examples of concept maps are spider map, flowchart, hierarchy/chronological map, and system mapping.	
14. Transforming Conceptual Knowledge	For students to become successful learners, they need to move from learning isolated facts and skills to problem-solving strategies that transfer from one context to another. These skills will enable them to navigate lifelong situations that occur in the future. Educators must design lessons that help students see big picture ideas, recognize patterns, and make generalizations. Learning activities that ask students to move from the factual level to the conceptual level will aid in transferring ideas across content areas. Educators should provide opportunities for learners to move along the progression from sorting and classifying information to making connections (applying knowledge) among ideas and finally transferring concepts in the form of debates, simulations, and case studies.	
15. Self-regulation	Self-regulated learning is a cyclical process where learning consists of motivation, planning, monitoring, and evaluation. Through metacognition, the learner reflects and adjusts learning before moving onto the next task. Learners who can plan, set goals, choose strategies, monitor themselves, and reflect tend to be self-motivated and less stressed. Teachers must explicitly model the process of self-regulation and give students multiple opportunities to practice this strategy. Research shows that there is a correlation between using self-regulation strategies and higher academic performance levels.	

Strategy	Explanation	Surface? Deep? Transfer?
16. Note-taking	Note-taking is defined as the process of recording information key information from different sources or platforms: such as lectures, field trips, flipped classrooms, videos, interviews. Note-taking is a powerful cognitive tool that actively engages the brain to connect to and retain information. It helps make connections between ideas. Adding visuals images to represent words or concepts during the note-taking process has a positive effect on memory and understanding of information. When students are able to take notes for themselves engagement in learning increases and they develop a stronger sense of self-efficacy	
17. Reciprocal Teaching	Reciprocal teaching is a strategy used across content areas to bolster students' reading comprehension and understanding of a given topic. In this strategy, teachers and students share in the teaching and discussion through a structured dialogue. The teacher begins by modeling the four steps: summarizing, questioning, clarifying, and predicting. Then students work in small groups where they take turns taking the lead role of the teacher to walk their group through the four-step process dialoguing about the reading assignment. Reciprocal teaching actively engages students in the learning process, teaches them to ask meaningful questions, and makes the text more comprehensible.	

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