



ARTICLE

Effective Instructional Strategies Supporting Classroom Instruction

This document contains summary briefs for the thirteen effective instructional strategies presented in this course, along with ideas for implementation.

Summary Brief: Setting Goals and Providing Feedback

Studies of effective goal setting suggest that goals with a narrow focus will actually minimize learning, because students focus on what has been communicated as important. If goals are too focused, students will ignore related information. Since students focus on what has been set forth as an objective, communicating those objectives becomes central to success. Providing the right kind of feedback to students can make a significant difference in their achievement. There are two key considerations. First, feedback that improves learning is responsive to specific aspects of student work, such as test or homework answers, and provides specific and related suggestions. There needs to be a strong link between the teacher's comment and the student's answer, and it must be instructive. This kind of feedback extends the opportunity to teach by alleviating misunderstanding and reinforcing learning. Second, the feedback must be timely. If students receive feedback no more than a day after a test or homework assignment has been turned in, it will increase the window of opportunity for learning.

Ideas for Implementation

- State goals in the form of an essential question or questions at the beginning of a unit or lesson. The essential question should focus on understanding and applying learning.
- Develop flexible and general goals. If a goal is too focused on a narrowly defined outcome, it limits learning potential. If students are shown one example of successful learning it will inhibit the possible range of artifacts students would create in their authentic construction of knowledge. If students understand that the goal is for them to learn how a piston works, they may fail to learn its relationship to other parts in an engine.
- Ask students to create their own goals. Help them personalize and refine their own sets of goals by sharing examples, modeling the process, or creating strategies for documenting and completion, such as contracts, video-recordings, or learning journals.
- Give students time to adapt the concepts and ideas in goals to their interests, learning styles, and existing knowledge base.
- Use advance organizers to help students prepare for, focus on, and personalize goals.
- Help students understand there are short-term and long-term goals. Provide students practice setting personal goals and meeting them in different contexts.
- Ensure that goals are less about accomplishing tasks and more focused on understanding and applying concepts.
- Take time to write comments, point out omissions, and explain your thinking when reviewing student work.
- Provide explicit and corrective feedback when returning student work. Make feedback another part of the learning process by helping students to see their errors and learn how to correct them.
- Provide timely feedback so students can make a strong connection between the feedback and their effort.
- Engage students in review of their own work and that of others.

- Give students time to absorb new ideas. Tests are more effective as opportunities for learning if a day has gone by between learning experiences and the test.
- Use rubrics to provide criteria against which students can compare their learning and focus their effort. Involve students in developing rubrics.

Summary Brief: Activating Prior Knowledge

Research has shown that when students are able to think about or discuss what they know about a topic before receiving instruction, their comprehension improves. Activating prior knowledge prepares students for learning by helping them make connections between what they already know and what they are about to learn. When activating prior knowledge, students use their preexisting attitudes, experiences, and knowledge to make sense of new information. Activating prior knowledge makes learning more personal and meaningful and sparks students' interests. Students need to be explicitly taught strategies for activating their prior knowledge so they learn how to do this independently, as a lifelong learner. Teachers should check students' levels of prior knowledge to inform and adjust instruction or correct misconceptions or stereotypes.

Ideas for Implementation

- Engage students in activities that they can relate to, either in school or outside of school.
- Have students brainstorm about a topic before you present it.
- Use graphic organizers, such as a K-W-L charts, to engage students in thinking about what they know, what they want to know, and what they have learned about a topic.
- Ask specific and general questions to determine students' levels of prior knowledge about the topic; then, use this information to inform and adjust your instruction.
- Encourage students to make personal connections to the text, to the world, and to other texts.
- Have students predict what they think might happen next in a story or during an experiment.
- Use anticipation guides prior to presenting a new concept to engage students in exploring their thoughts and opinions.
- Model how to use context clues to determine the meanings of unfamiliar words.
- Model how to preview text and identify text structures to set a purpose for reading (such as looking at the title, headings, and visuals).
- Use think-alouds to show students your thinking process when reading text.
- Have students create a concept map to help them link new information to what they already know.
- Use grouping and cooperative learning activities to promote sharing of prior knowledge and cultural experiences.
- Provide students with advance organizers, such as teacher's notes or graphic organizers, so they can preview what they will be learning.

Summary Brief: Nonlinguistic Representations

In addition to traditional linguistic modes of instruction, learners also acquire and retain knowledge nonlinguistically, through visual imagery, kinesthetic or whole-body modes, auditory experiences, and so forth. Teachers who wish to take advantage of all modes of learning will encourage students to make nonlinguistic representations of their thinking. These can take many forms. When students make concept maps, idea webs, dramatizations, and other types of nonlinguistic representation, they are actively creating a model of their thinking. Computer simulations also encourage exploration and experimentation by allowing learners to manipulate their learning experience and visualize results. When students then explain their models, they are putting their thinking into words. This may lead to new questions and discussions, which will in turn promote deeper thinking and better understanding.

Ideas for Implementation

- Scaffold student learning as you introduce activities such as concept maps, idea webs, and computer simulations by modeling how to use tools that help them represent their thinking nonverbally. Gradually remove the scaffolds so students eventually work independently with the new tool or technology.
- Encourage students to work in small teams when they are constructing nonlinguistic representations. Students' questions and discussions will help them communicate and refine their thinking.
- Teach students to represent and interpret information in graphs, charts, maps, and other formats that will help them see patterns and make connections so they can later recall and apply what they have learned.
- Use simulation software or online simulations to let students practice making predictions and testing outcomes. Combine nonlinguistic experimentation with verbal discussion, prompting students to think through their understanding and raise new questions.
- Provide opportunities for students to learn through physical activities such as dramatizations, dance, music, simulations, and other active learning experiences
- Encourage students to integrate meaningful, nonlinguistic forms in their note taking, such as, sketches, graphs, and symbols.

Summary Brief: Identifying Similarities and Differences

As an instructional strategy, identifying similarities and differences involves various activities that help learners see patterns and make connections. For example, students compare things that are similar and contrast things that express differences. They classify when they identify features or characteristics of a group of objects or ideas, and then develop a scheme to organize those objects. Metaphors are created when two ideas or experiences are compared based on a common underlying structure. Finally, analogies provide another way to identify similarities and make comparisons. Each approach helps the brain process new information, recall it, and learn by overlaying a known pattern onto an unknown one to find similarities and differences. Looking for similarities and differences prompts the learner to consider, "What do I already know that will help me learn this new idea?" This fosters relationships and connections to new understanding.

Ideas for Implementation

- Present students with similarities and differences explicitly when this helps them reach a learning goal. As a result of the teacher's instruction, students recognize similarities and differences in order to understand something specific.
- Allow students to explore similarities and differences on their own. When the learning goal is to engage students in divergent thinking, ask them to identify similarities and differences on their own.
- Help students to create or use graphic or symbolic representations of similarities and differences, classification systems, comparisons, and analogies. Suggestions include Venn diagrams, comparison tables/charts/matrices, hierarchical taxonomies, t-charts, concept maps, and linked maps.
- Help students recognize when they are classifying, comparing, or creating analogies or metaphors.
- Model for students how to create and use the following types of analogies: antonym, synonym, descriptive, part-to-whole, item-to-category, cause-effect, function, temporal, and sequential.
- Show students how language is rich with metaphor. As students encounter literal or abstract metaphors in reading or speaking, generate a class list. Metaphors provide a source of history, generate literary references, and suggest new ways for students to express ideas.

Summary Brief: Generating and Testing Hypotheses

Across content areas and grade levels, inquiry in the classroom turns native curiosity to the learner's advantage. Effective teachers create these opportunities to guide students through the process of asking good questions, generating hypotheses and predictions, investigating through testing or research, making observations, and finally analyzing and communicating results. Through active learning experiences, students deepen their understanding of key concepts.

Inquiry extends far beyond the science classroom. In math, students make predictions based on their understanding of statistics. In history, students look for evidence to support their theory about why certain events unfolded. In language arts, students predict what comes next in a story based on events that have already transpired. In every context, teachers can make inquiry more effective by scaffolding the learning experience.

Ideas for Implementation

- Teach students how to frame a good question so they can narrow their inquiry to a topic that can be reasonably explored.
- Provide students with templates and sentence stems to help them frame questions and explain their hypothesis and conclusions.
- Encourage students to explain their hypotheses or predictions aloud. This will prompt them to explain their understanding of underlying concepts, giving you a window into their understanding.
- Watch for (and mediate) misconceptions. If students are basing a prediction on a false premise or conceptual misunderstanding, set up activities to challenge their thinking.
- Scaffold investigations. Structure students' learning experiences to maximize results. Provide them with a framework for investigating.
- Use role play to prompt students to make predictions: based on what they know about their role, how will their character react? How will the agent interact with other agents?
- Help students recognize patterns in their findings. Show them how to transform raw data into graphs or other visual representations that will help them see patterns and make connections.
- Ask questions throughout the inquiry cycle. At each stage, challenge students to explain their reasoning and defend their results.
- Offer students opportunities to engage in different forms of generating and testing hypotheses, such as:
 - *Systems Analysis*: Students evaluate the parts of a system—such as computer networks, ecosystems, and government—and predict what would happen if a part were changed. (Web resource: http://www.bbc.co.uk/schools/ks2bitesize/science/living_things.shtml)
 - *Problem Solving*: Students evaluate different solutions to a problem, then generate and test their hypotheses. (Web resources: <http://www.learner.org/interactives/parkphysics/coaster/>)
 - *Historical Investigation*: Students create reasonable scenarios of past events for which there is no general agreement, such as the sinking of Titanic, the disappearance of Amelia Earhart, the assassination of President Kennedy, and so forth. (Web resources: <http://americanhistory.si.edu/kids/springer/> or <http://pbskids.org/historydetectives>)
 - *Invention*: Students create products or processes to meet a specific need. (Web resource: <http://www.inventionatplay.org/>)
 - *Experimental Inquiry*: Students explain observations, generate explanations, and make and test predictions. (Web resource: <http://school.discoveryeducation.com/sciencefaircentral/Getting-Started.html>)

- *Decision Making*: Students use a structured decision-making framework to examine results of hypothesis testing, such as choosing the best or worst of a specific category. (Web resources: <http://kids.mysterynet.com/>)

Summary Brief: Summarizing and Note Taking

Helping students recognize how information is structured will help them summarize what they read or hear. Students who can effectively summarize learn to synthesize information—a higher-order thinking skill which includes analyzing information, identifying key concepts, and defining extraneous information. Note taking is a related strategy that teachers use to support student learning. Without explicit instruction in note taking, however, many students simply write down words or phrases word for word, without analysis (or good effect). Successful note-takers summarize to arrive at a nugget of meaning, which they are much more likely to retain. Students also benefit from using their notes as a document of their learning. Teachers can prompt students to review and refine their notes, particularly when it is time to prepare for an exam, write a research paper, or participate in another summative assessment of learning.

Ideas for Implementation

- Teach students the delete-substitute-keep process for summarizing. A "rule-based strategy" for summarizing includes a specific set of steps (Brown, Campione, & Day, 1981). The steps are:
 1. Delete unnecessary words or sentences.
 2. Delete redundant words or sentences.
 3. Substitute super-ordinate terms (for example, "trees" for pines, oaks, and maples).
 4. Select or create a topic sentence.
- Help students identify how information is structured in different formats. For example, when they begin reading a play, make sure students understand the difference between scene descriptions, stage directions, and dialog. Use a newspaper to show them how news and opinion writing is structured differently. Examine a Website together to make sure students understand which content is paid advertising.
- Model for your students how to take effective notes. Provide an outline of the information you are going to cover in class, which students can use as the starting point for their own notes. Show them that notes are living documents that change and evolve as the note-taker gains new understanding.
- Use framing questions to focus attention on key concepts you want students to remember. To encourage students to synthesize ideas, give them a word limitation for summarizing information concisely.
- Encourage students to personalize their notes, using sketches, diagrams, color codes, idea webs, or other approaches that make sense to them. What matters most is that students make notes that are meaningful and useful to them.
- Have students compare and discuss their notes in small groups as a method of review and test preparation.
- Introduce a variety of graphic organizers for note-taking, such as Cornell notes, the Frayer model, or the Herringbone. Consider using electronic forms of graphic organizers.

Summary Brief: Cooperative Learning

Effective cooperative learning occurs when students work together to accomplish shared goals and when positive structures are in place to support that process (Johnson & Johnson, 1999). Even though appropriate use of student groups for learning has been shown to yield significant learning improvement across disciplines, the successful application of cooperative grouping in classrooms still eludes many educators (Johnson & Johnson, 1999). Criteria for effective cooperative learning groups include:

- "Positive interdependence" includes mutual goals, joint rewards, resource interdependence (each group member has different resources that must be combined to complete the assignment), and role interdependence (each group member is assigned a specific role).
- Students help each other learn and encourage individual team members' success.
- Individuals in the group understand that they are accountable to each other and to the group as a distinct unit.
- Interpersonal and small-group skills are in place, including communication, decision making, conflict resolution, and time management.
- Members are aware of the group's processes. Individual members talk about "the group" as a unique entity.

Ideas for Implementation

- Create the right type of group for the specific need. Sometimes an occasional informal ad hoc group is needed, such as think-pair-share. Base groups are formed for long-term social and interpersonal support. Formal learning groups are used when a commitment of time and effort is required.
- Keep group size small. Ideally, learning groups include no more than four students. Base groups may be larger, up to six students.
- Use ability grouping sparingly. Students across the spectrum of abilities—especially low-ability students—benefit by heterogeneous grouping.
- Don't use cooperative learning for all instructional goals. Students need time to investigate ideas and pursue interests on their own.
- Use a variety of strategies when choosing students for groups. Many selection strategies (common clothing, favorite colors, letters in names, birthdays) will work when attempting to randomly group students.
- Develop organizational tools, forms, learning journals, and other structuring documents that foster the smooth processes needed for effective cooperation and group work. Use online tools for ubiquitous access to forms.
- Teach specific skills before grouping students, define criteria for success, and develop rubrics for key expectations. Meet with new group members to support their success.

Summary Brief: Reinforcing Effort and Providing Recognition

Although research on learning tends to focus on instructional strategies related to subject matter, students' beliefs and attitudes have a significant effect on their success or failure in school. Students growing up amid challenges can develop an attitude that "failure is just around the corner," no matter what. Research makes clear the connection between effort and achievement—believing you can often makes it so. This research shares recommendations and techniques that encompass student recognition, beliefs, and attitudes about learning.

Ideas for Implementation

- Teach the relationship between effort and achievement. Draw examples from the well-known as well as the unknown, so students recognize success in all situations and under many circumstances. Encourage students to question what effort looks like.
- Reinforce effort. Students who are recognized for effort will make the connection between effort and improvement. Students should be helped to internalize the value of effort to make a strong connection between effort and the desired outcome.
- Visual representation of effort may increase effort. Students who are helped to design an "effort log" using graphic representation will be more likely to see it in their mind's eye, and refer to it when working. Consider integrating technology such as spreadsheets or tables and charts to record and show student progress.
- Create a class effort rubric. A class that shares a common definition for effort will also share the understanding of effort and achievement. When students are in learning or study groups, they will have a common language and a shared ideal regarding effort and achievement.
- Be careful about how and when recognition is provided. Verbal praise for small or easy tasks can be construed by students as undeserved, and may actually decrease effort. Ensure that praise and rewards are provided because an authentic standard of performance has been achieved. Doing an activity to a predetermined standard may well be worthy of reward and result in increased effort and motivation.
- Recognize individual students for personal progress. When students have personal goals, or reach predetermined standards of excellence, recognition is for personal achievement, which is unique to each student.
- Make clear the real goal of effort. "The harder you try, the more successful you are" is what the act of recognition should communicate to students, not "the harder you try, the more prizes you get." Make this clear to students and apply it in practice.

Summary Brief: Homework and Practice

Homework and practice are related, as they overlap when students are learning on their own and applying new knowledge. Effective teachers approach this kind of learning experience as any other—matching the planned activity to the learning goal. Research on homework indicates that it should be approached not as an afterthought to the school day, but as a focused strategy for increasing understanding. The goal of practice is for students to get as close to mastery as possible.

Ideas for Implementation

- Understand the four types of homework. Know when and why to have students practice:
 1. Memorization of basic rules, algorithms, or laws, so the skill becomes rote.
 2. Increase in skill speed, used for improving students' abilities to apply these skills in more complex problem solving.
 3. Deepening understanding of a concept—providing students time to read further, elaborating on a new idea, and expanding their understanding.
 4. Preparation for the following day's learning, such as an advance organizer or cue to increase readiness for new information.
- Assign the appropriate homework type to meet the learning goal and to make homework a more focused learning experience.
- Assign homework at the instructional level that matches students' skills.
- Assign the right amount of homework time. A good rule of thumb is to multiply the grade $\times 10$ to approximate the right amount of minutes per night for students.
- Provide positive recognition for homework completion and appropriate consequences for lack of completion, on a consistent basis.
- Recognize student uniqueness. Students need time to adapt and shape what they are learning as they practice.
- Create and communicate a homework policy at the school level. Policies developed in individual classrooms may communicate a mixed message to parents, and create confusion and frustration. Include expectations, consequences, guidelines, and helpful tips in school homework policies.
- Communicate ways that families can support homework. Parents should provide a consistent time and place in the home for children to complete homework. Help parents understand that they are not expected to be content experts. If a student needs help with content, that's a sign that the homework assignment may be too difficult.
- Make the goal of a homework assignment explicit and clear to everyone, including students.
- Provide constructive and timely feedback that corrects misunderstanding, validates process, and highlights errors in thinking within hours or a day after students complete an assignment.
- Use journals, trackers, and other tools to help students organize assignments and support communication between student, teacher, and parents. Consider using organizational and communication technological tools as resources.

Summary Brief: Comprehension Strategies

Comprehension is the goal of reading. Good readers establish a purpose for reading, and think actively as they read, employing a variety of strategies to help them make meaning from text. Teaching comprehension strategies is critical to developing students' comprehension. Teachers should explicitly teach comprehension strategies, showing students which strategies to use and when. Explicit instruction can be achieved by the teacher explaining the strategy and modeling it for students. Next the teacher engages students in guided practice, independent practice, and finally application of the strategy.

Ideas for Implementation

- Provide explicit instruction for the following strategies:
 - Setting a purpose for reading
 - Visualizing
 - Summarizing
 - Determining important information
 - Making/revising predictions
 - Making inferences
 - Activating, applying, and integrating prior knowledge
 - Attending to text structure
 - Generating and responding to questions
 - Self-correcting and self-monitoring
- Explain which strategies to use before, during, and after reading.
- Model comprehension strategies using think-alouds. While reading a text, share with your students your specific thought processes. Share with them what you are wondering about, what might be confusing to you, what visual images the text evokes, or what questions are forming in your mind.
- Incorporate student think-alouds by having them verbalize their thought processes and strategy selections when reading a specific text.
- Use graphic and semantic organizers to help students organize, illustrate, and summarize their understanding of the text.
- Teach students how to differentiate between genres, identify elements of text, and recognize text structure.
- Show students how to use “fix up” strategies to monitor and repair comprehension.
- Teach students the relationship between questions and where to find answers. The different question-answer relationships that can be taught are text explicit, text implicit, and scriptal.
- Provide cooperative learning opportunities for students to help peers apply comprehension strategies.

Summary Brief: Vocabulary

Vocabulary, as an effective strategy, incorporates direct vocabulary instruction so students learn the academic vocabulary needed to understand the concepts they are being taught. Through direct instruction, teachers provide descriptions, explanations, or examples of the term. Then, students restate the term in their own words and create a nonlinguistic representation of the term. Students can further develop their understanding of the term by creating metaphors. Providing multiple and varied exposures to the term also strengthens students' understanding.

Ideas for Implementation

- Activate students' prior knowledge by asking them how the term is similar to ones they already know, have them predict what the term means, or have them brainstorm by identifying the first word that comes to mind.
- Use word sorts to help students classify and categorize terms.
- Choose terms students will encounter in the new content being learned.
- Integrate vocabulary games into instruction so students have additional exposure to the new terms. Check the Internet for online games that could be used in the classroom.
- Teach word parts to enhance students' understanding of key vocabulary.
- Create activities where students can interact with the terms in a variety of ways, such as writing, nonlinguistic representations, comparing and contrasting, identifying similarities and differences, and creating metaphors and analogies.
- Provide opportunities for students to take notes and revise their initial understandings of the new terms by having students keep vocabulary notebooks, logs, or journals.
- Create a rubric to help students assess their understandings of new terms, and provide opportunities for them to reassess throughout a unit or over the course of the year.
- Use think-pair-share to allow students opportunities to discuss new terms with their peers.

Summary Brief: Writing

Writing can be an effective strategy when used as a thinking tool for solving problems, identifying issues, constructing questions, and revising thinking. Writing instruction should be integrated with content instruction so students can recognize writing as a natural extension of learning. Writing tasks should be meaningful and authentic, and should offer students the opportunity to engage in personal expression, reflection, and discovery. Teachers should explicitly teach the following:

- The components of the writing process: drafting, revising, editing, publishing
- How to distinguish the features of genre, such as narrative, persuasive, informational, poetry, and technical writing
- How to identify expository text structures, such as compare/contrast, cause/effect, description, problem/solution, and sequence
- How to write with the awareness of the five domains of writing: focus, content, organization, style, conventions

Ideas for Implementation

- Engage students in writing for a variety of purposes and audiences, such as journals, writer's notebook, blogs, lab reports, essays, and creative, practical, and technical writing
- Have students establish learning goals for their writing and provide timely and specific feedback on their progress throughout the lesson or unit.
- Introduce different genres using touchstone texts or texts that best represent the elements and structure of the genre. Use student writing samples when possible.
- Establish writing routines in the classroom so students know what to expect.
- Use think-alouds to model writing strategies students can use during the components of the writing process.
- Create inquiry activities where students develop ideas and content for a writing task by analyzing data prior to writing. Activities can involve the senses of touch, taste, and smell.
- Give specific and timely feedback on writing tasks.
- Conduct teacher-student and peer-peer writing conferences to discuss work samples.
- Assess student work using rubrics that incorporate the five domains of writing.
- Have students create their own rubrics for scoring writing tasks.
- Allow students the opportunity to collaborate with other students to plan, draft, revise, and edit their writing.
- Integrate technology as an instructional support for student writing, such as word processing programs for spelling and grammar check, or Kidspiration to develop visual tools for organizing ideas.
- Have students keep a writing portfolio to highlight samples of their work that meet their learning goals.
- Develop classroom tools, checklists, mnemonic devices, or other resources students can use to revise and edit their writing.
- Display exemplary student work.

Summary Brief: Formative Assessment

Formative assessment is assessment for learning. Formative assessment allows teachers to monitor and adjust their instructional practices in order to meet the individual needs of students. The key to formative assessment is using the results to shape teaching and learning. Teachers can use this information to make necessary on-the-spot instructional adjustments, such as re-teaching, trying different instructional strategies, or offering more opportunities for practice. Formative assessment also enables students to self-assess their progress in meeting the learning goals and make any necessary adjustments to improve their understanding. Formative assessment should be ongoing and integrated into daily instructional routines. Minute-to-minute assessments and quick checks are two methods for informally assessing students. Minute-to-minute assessments, which involve immediate student responses, can occur throughout the lesson to gauge students' levels of understanding. Quick checks can be used at the end of a lesson to engage students in self-reflection in meeting the learning goals and application of knowledge.

Ideas for Implementation

- Ask a range of higher and lower-order questions to assess for learning.
- Ask follow-up questions to discover gaps in student thinking and understanding.
- Provide on-the-spot instruction to fill in gaps discovered during questioning.
- Incorporate minute-to-minute techniques throughout the lesson, such as random reporter and every pupil response.
- Use think-pair-share to allow students to practice explaining their thinking to others, as well as to learn from their peers.
- Include quick-check assessments such as exit cards or one sentence summaries at the end of a lesson to allow students to summarize their learning for the day and to help you make adjustments to the next day's instruction.
- Use informal observational checklists to assess for student learning.
- Integrate technology into formative assessment methods by using audience response systems such as clickers.

References

Brown, A. L., Campione, J. C., & Day, J. (1981). Learning to learn: On training students to learn from texts. *Educational Researcher, 10*, 14-24.

Johnson, D. W., & Johnson, R. T. (1999). *Learning together and alone: Cooperative, competitive, and individualistic learning*. Boston: Allyn & Bacon.

Northwest Regional Educational Laboratory. *Focus on Effectiveness: Integrating technology into research-based strategies*. Retrieved July 1, 2009, from <http://www.netc.org/focus/strategies/>