BEST PRACTICES NEA RESEARCH BRIEF

Learning and Teaching

July 2006

This brief outlines nine leading research-based concepts that have served as a foundation for education reform. It compares existing ideas about learning, knowledge, and teaching with conceptual benchmarks for "best practice" that would be consistent with current research. The goal is to foster inquiry and support fundamental, long-term improvement by offering promising ideas for readers to consider, discuss, and adapt to their circumstances.

Over the past 20 years, the United States has been engaged in a national school reform movement focused on enabling all children to achieve high standards. Ideas drawn from recent research on learning and teaching have been influential in guiding many of these reform initiatives.

Contemporary Ideas About Learning

Learning as Active Engagement. Perhaps the most critical shift in learning theory during the past 20 years has been a move away from a conception of learning as passive absorption of information to a conception of learning as the active engagement of meaning. Earlier theories of learning viewed it as a passive process, and much of school learning has been based on this premise. Teachers have been expected to do most of the talking, and students have been directed to listen.

More recent theories of learning view it as an active, constructive process. Individuals attempt to make sense of incoming information by interpreting it in terms of their prior knowledge, by questioning its meaning, and by exploring its uses. Such activities play a critical role in enabling them to transform incoming information into usable knowledge. Students bring their own ideas or preconceptions to the learning process. Sometimes, students' naive theories resonate with academic knowledge and teachers can build on them. At other times, students start with misconceptions and, unless teachers are aware of and know how to address students' common misconceptions, students will not gain an understanding of academic knowledge. New knowledge always builds on prior knowledge. Therefore, if academic content is to make sense to students, teachers must connect it with students' background knowledge.

Learning as Social. A second significant shift in learning theory pertains to the social aspects of learning. Traditionally, learning in classroom settings has been organized largely as an individual activity. Students have been expected to learn mainly from listening to the

This brief is based on an NEA Research working paper, "Theories of Learning and Teaching: What Do They Mean for Educators," by Susanne M. Wilson and Penelope L. Peterson (2006). The working paper describes in more detail nine seminal ideas drawn from recent research on teaching and learning that have been influential in education reform and includes evidence and citations for the ideas summarized in this brief. The full paper can be ordered by mail or online from the NEA:

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teacher and working on their own rather than from engaging in meaningful interactions with their teacher and classmates about the content being taught.

Recent research calls our attention to the importance of social interactions, such as conversations, discussions, joint work, and debate, in influencing classroom learning. Such interactions provide opportunities for students to learn through observing the performance of others, receiving feedback about their own performance, hearing alternative points of view, and engaging in the exchange of ideas.

The thinking that occurs when students work together is not solely the product of one mind. Rather, it comes from different minds in interaction with one another. This enables students to hear ideas and make connections that they might not be able to make on their own. In a social setting, students can assist each other and develop jointly constructed ideas. As educators have become increasingly aware of how social interactions influence learning, some have begun to argue for inclusion of a wider array of teaching strategies in American classrooms. These include increased opportunities for students to participate in classroom discussions, to work together in small-group settings to solve complex problems, and to participate in cooperative learning activities.

Learner Differences as Resources. Modern learning theories offer new perspectives about differences among learners. One of the self-evident truths of schooling is that learners come with different experiences, capacities, understandings, and backgrounds. Although U.S. teachers have always had to deal with such differences, today they confront more diverse student populations than ever before.

Contemporary learning theories help us understand that all students, regardless of their social and cultural backgrounds, come to school with active, inquiring minds. Using those theories, researchers have documented how teachers can use the differences in thinking that students bring to instruction as resources for enhancing classroom learning.

Recent studies of mathematics instruction in Japanese classrooms provide a case in point. In these classrooms, all students are asked to solve challenging problems. As they work toward a solution, their teachers encourage them to share their ideas and approaches with their classmates. Japanese teachers find that such sharing enhances student learning by providing a range of ideas and strategies for students to consider and discuss.

Knowing What, How, and Why. A fourth and final shift in learning theory involves assumptions about the nature of the knowledge students should be expected to acquire in school to function effectively as thinkers and problem solvers.

For several decades now, researchers have been looking closely at how experts in various fields (e.g., chess, mathematics, and history) go about solving problems in their own specialized areas. Experts, regardless of their field, draw on a rich and well-structured knowledge base. Their understanding of important concepts in their fields enables them to see patterns and relationships that are not apparent to novices.

Such research offers new insights concerning the nature of the knowledge students should be expected to acquire in school. It suggests that to attain competence in an academic discipline, students must (a) possess a deep foundation of factual knowledge; (b) understand facts and ideas in the context of a conceptual framework or schema; and (c) learn how to organize their knowledge in ways that facilitate retrieval and application.

In short, teachers can no longer afford to focus solely on teaching the facts and procedures of a discipline. They also need to help their students understand its central ideas and concepts and develop competency in using its processes of inquiry and argument.

The Implications for Teaching and Teachers

Teaching as Intellectual Work. Assumptions about learning have significant implications for teachers and teaching. There is a widespread belief that the work of teaching is simple and straightforward. Follow the textbook, get students

to pay attention, and they will learn. Now, with far more challenging goals for students, teaching must be viewed as complex, intellectual work. Table 1 compares typical existing practices with conceptual benchmarks for best practices that would be consistent with recent research.

Thoughtful teachers are intellectuals. To be an effective teacher, one must find ways of building bridges between one's subject matter and one's students. As teachers plan instruction, they need to weigh their options carefully, making decisions about which methods and content best meet their instructional goals and the needs of their students for a given unit of instruction. The emphasis on the intellectual aspects of teaching is not intended to override the moral aspects of teaching—the mind cannot be divorced from the heart. The combination of the intellectual and moral aspects of teaching only adds to the complexity.

To make effective decisions, teachers need to draw on the ideas about learning delineated above. For example, as they make decisions about what to teach, they need to take into account the nature of the knowledge they want their students to acquire. They need to explore what their students already know, so that they can help them relate their background knowledge to the new information that is presented during instruction. They need to find ways of organizing their classrooms into communities of learners in which students work together effectively to help one another construct new knowledge.

As fundamental assumptions about the work of teaching have changed, so has teacher evaluation. Reflecting the view that teaching is complex work, the evaluation process is no longer limited to observation of teachers in the act of teaching. Teachers are now also expected to be able to

Table 1. Benchmarks for Learning and Teaching

Benchmarks for…	Moving from…	Moving toward…
Learning	Passive absorption of information	Active construction of meaning
	Individual activity	Both individual activity and collective work
	Individual differences among students seen as problems	Individual differences among students seen as resources
Knowledge	What: Facts and procedures of a discipline	What, how, and why: Central ideas, concepts, facts, processes of inquiry and argument of a discipline
Teaching	Simple, straightforward work	Complex, intellectual work
	Teachers in information-deliverer role	Varied teacher roles, from information deliverer to architect of educative experiences
	Teachers do most of the work	Teachers structure classrooms for individual and shared work
	Lessons contain low-level content, concepts mentioned; lessons not coherently organized	Lessons focus on high-level and basic content, concepts developed and elaborated; lessons coherently organized
	Teachers as founts of knowledge	Teachers know a lot and are inclined to improve their practice continually

articulate their learning goals clearly, to explain why they taught as they did, and to justify their choices. This far more rigorous approach to evaluation is intended to hold teachers accountable—as all professionals are—for their actions.

Teaching as Varied Work. The ideal classroom is no longer one in which 30 students are always listening to the teacher or silently working. To teach in ways that are consistent with the assumptions about learning stated above, teachers cannot function mainly as information deliverers. They need to use a broader range of instructional strategies.

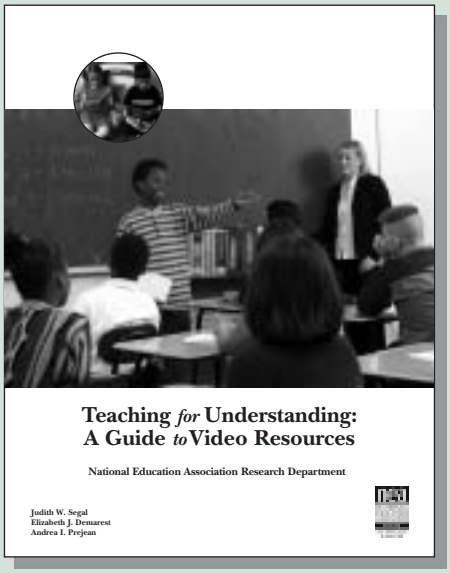
Part of learning will still involve lecture, drill, and practice, because students must learn some basic knowledge to the point where it can be effortlessly retrieved, so that it can inform interpretation and debate. However, students will also need to spend time working in alternative arrangements—small and large groups—talking to each other, making public their personal knowledge and beliefs, constructing and testing their knowledge with peers and teachers. To help them do this, teachers will need to have at their disposal a wide range of instructional strategies and will need to know when and how to make effective use of them.

Teaching as Shared Work. Once we begin to think about classrooms as communities of learners, it becomes important to provide meaningful opportunities for students to interact with one another as well as the teacher about the content taught. Through such interactions, students can play an important role in providing questions, ideas, and explanations that can stimulate thinking and understanding on the part of the other students in the classroom.

In this sense, teaching can be viewed as shared work—work that is jointly conducted by the teacher and the students. Teachers are solely responsible for designing and orchestrating the overall approaches to instruction that are used in their classrooms. However, the methods they select should provide opportunities for students to make contributions to classroom conversations that will be effective in stimulating thinking and understanding on the part of other students.

Cooperative learning, team learning, and reciprocal teaching are all examples of ways of organizing classroom instruction that enable students to play a meaningful role in the teaching process.

Teaching of Challenging Content. The assumptions about learning and knowledge already discussed have implications for how content should be treated in U.S. schools. Running through contemporary visions of school reform is the notion that all students should be given the opportunity to learn challenging content.



Seeing Examples of "Teaching for Understanding"

Effective approaches to teaching challenging content to all students vary depending on the subject, the grade level, and many other factors. It is beyond the scope of this brief to describe "teaching for understanding" in detail in the wide variety of contexts that different teachers may experience. Fortunately, a growing array of video material is becoming available depicting teaching that is consistent with research and professional standards. Videos can serve as one tool for instructional improvement. To help teachers locate and use this video material, the NEA has developed a publication, "Teaching for Understanding: A Guide to Video Resources." It can be ordered at www.nea.org/books.

Recent studies indicate that the United States has a long way to go in achieving this vision. International comparisons of mathematics and science instruction describe the curriculum in this country as thin and fragmented and describe instruction as focusing mainly on helping students learn basic facts and routine procedures. The vision reformers are promoting calls for major changes in how content is treated. To implement this vision, teachers will need to shift from focusing mainly on the basics to teaching content that is more advanced as well. They will need to find effective ways of making such content understandable to their students. Instead of simply mentioning important concepts, they will need to take time to develop and elaborate them in ways that foster understanding. If students are to learn how concepts fit into larger disciplinary schemes, lessons will need to be more coherently organized.

Such changes in teaching entail changes in teachers' knowledge. To be able to make challenging content understandable to students, teachers will need to possess deep knowledge of the content areas they are assigned to teach. Advanced teacher knowledge is necessary even to teach the basics when these are taught for understanding rather than memorized by rote.

Teaching as Inquiry. If teachers are to succeed in making the substantial changes in their practice necessary to meet today's high expectations, they must be able to spend more time studying their practice and its impact on student learning. They must regularly update their professional knowledge, including both content and pedagogical knowledge.

Teachers need to collect information through formative assessment about the nature of the knowledge their students bring to instruction and about how such knowledge changes over the course of instruction. As they identify promising approaches to instruction, they need opportunities to try them out in their own classrooms and assess the impact of alternative teaching strategies on their students' developing understanding of the content. In so doing, they need to act as scientists, probing the thinking underlying their students' oral and written classroom contributions and sometimes interviewing them about their thoughts and logic.

New approaches have evolved in recent years for helping teachers study their practice. One that is widely used in Japanese schools and that has been rapidly gaining popularity in U.S. schools is called "lesson study," an approach whereby groups of teachers collaboratively plan, teach, criticize, and revise their lessons. Another approach that is widely used in U.S. schools is "action research," an approach whereby practitioners conduct and report on their attempts to inquire into their own practice and that of their colleagues.

Conclusion

It has been said that "nothing is as practical as a good theory." All teachers operate according to theories about learning and teaching, some tacit and others explicit. Good teaching requires teachers to construct and reconstruct their theories continually and to determine through systematic, careful inquiry whether their theories result in the kind of best teaching practices that will enable all their students to meet today's high expectations for learning and achievement.

Tip for Use

This material is most effectively used to frame group discussion among teachers and teacher-candidates in which the focus is on fundamentally rethinking learning and teaching. As participants discuss the research concepts, they should be encouraged to contribute practical examples from their classrooms and school. The summary table in the brief can become an overhead transparency and may be useful as a discussion guide. The working paper on which this brief is based supports a more in-depth discussion.

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