

TEACHING FOR UNDERSTANDING

by Doug Buehl

“Um . . . let's see . . . Roosevelt's New Deal. Uh . . . The National Recovery Administration (NRA) worked with industries to develop fair practices codes. The Tennessee Valley Authority (TVA) did flood prevention. The Public Works Administration (PWA) built projects like powerplants and dams. The CCC was the . . . um . . . Civilian Conservation Corps and gave jobs to people to work in parks and on other public works. The National Labor Relations Board helped labor unions. The Social Security act”

A glimpse into the mind of a student, as she delves through the information in a history chapter, perhaps prepping for the unit test. A typical scene in our schools, enacted daily in classes from science to foreign language, math to English literature. But, when the test is over and the transition to the next unit of study has been undertaken, a lingering, nagging question invariably remains: did they get it? Did students, for example, really grasp the significance of the New Deal period of American history? Did they truly understand?

Often they don't, argue Grant Wiggins and Jay McTighe (1998). Citing a body of evidence that verifies the persistence of misconceptions and misunderstandings, even after instruction to the contrary, Wiggins and McTighe conclude that students often only skim the surface of understanding as they cover the topics in the curriculum. They become conversant with some of the basic information and terminology of a topic, but may not be able to demonstrate that they truly have internalized the essence of the learning. And, unfortunately, even their modest acquaintanceship with the topic is frequently soon forgotten.

In their book, *Understanding By Design* (1998), Wiggins and McTighe offer a vision for curriculum planning that intentionally counteracts what they regard as the twin sins of content lessons: coverage and cute activities. The pressure to *cover* topics, rather than engage students in sufficient in-depth processing, leads to a curriculum that goes by much too quickly; students get a mere glimpse into a topic without understanding much about it. *Cute activities*, on the other hand, are an attempt to engage students into learning, but often for what purpose? The activity becomes the curriculum and students obtain little meaningful understanding of why the topic was a significant one for study.



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Backward Design:

A Strategy To Deepen Understanding

Wiggins and McTighe advocate the strategy of "Backward Design" as a means for teaching for deeper understanding of key curriculum concepts and ideas. Curriculum planning using Backward Design involves determining the unit assessments before deciding upon daily instructional activities.

Start with a focus on the "big ideas" in a curricular unit. As you begin planning, consider what it is about this topic that makes it so important for your students to learn. What are the central and organizing ideas that you would want your students to still remember and understand years after they have left your classroom?

Big ideas are the glue of a unit; they provide the connections between and coherence for the wealth of information that often overwhelms students. A big idea could be a scientific principle (law

of gravity) or theory (evolution), a concept (industrial revolution), a point of view (libertarianism), or a theme (conflict over resources as a cause of war).

In our history example at the beginning of this article, big ideas undergirding a unit on "the New Deal" might relate to the concepts of "the role of government" and "a government's responsibility to its citizens" and conflicting points of view on this role and responsibility.

Once the central focus of the unit has been clearly articulated, formulate perhaps one or two clearly worded statements that represent what exactly you want students to understand about these big ideas. Wiggins and McTighe caution that this is a challenging but essential aspect of backward designing; as teachers we may not have clearly articulated to ourselves what we want students to realize about a topic. These understandings are usually important concepts, generalizations, or conclusions about the material that students will be studying, and sometimes they are counter-intuitive or may directly conflict with students' current thinking about the topic.

These big idea statements should represent what Wiggins and McTighe term "enduring understandings," ideas that students should really retain over time and which have lasting value beyond the classroom. The following are examples of enduring understandings that might form the gist of a unit of study:

- * Plants are sophisticated factories that produce their own food through the process of photosynthesis.
- * The physical geography and climate of a region influence the culture, economy, and lifestyle of its inhabitants.
- * Satire uses irony, exaggeration, and sarcasm to expose and ridicule practices with which the author is in disagreement.
- * People disagree as to the appropriate role of a government as it carries out its responsibilities in supporting its citizens.

The next element of a backward design is to determine how you will assess whether the students truly understood the big ideas of the unit. How can the students demonstrate or apply their understanding so it is evident that they internalized the key ideas and have relinquished misconceptions or misunderstandings they may have brought to their learning? Wiggins uses a judicial analogy: assume that the students are innocent of understanding until they have been proven guilty. "Circumstantial" evidence, such as quiz scores or recall of basic information on an exam, would not be sufficient grounds for declaring students "guilty" of understanding. Assessments should build a convincing case that the students "got it."

Projects, debates, role playing, and other performance activities could be integrated into an end-of-unit assessment to provide meaningful feedback both to students and teacher about the depth of understanding attained during the unit. In our New Deal example, assessment that asked students to apply their understandings to today's dialogue about the government's role in areas such as health care, disaster relief, and privatization of social security can demonstrate that they really got the point about this important historical period.

Wiggins and McTighe caution that enduring understandings are not intended to be taught to students as facts. Instead, they represent the insight which students must all individually develop about the material as they process the information and engage in learning during the unit.

Backward Design is a strategy that turns most unit planning on its head and emphasizes key ideas that impact the way students view their world. As a result:

- * Students are less likely to become so immersed in the factual detail of a unit that they miss the whole point for studying the topic.

* Instruction focuses on global understandings and not on the daily activities; daily lessons are constructed with a clear vision of what the overall "gain" from the unit is to be.

* Assessment is designed before lesson planning, so that instruction drives students toward the essence of what they need to know.

Developing Essential Questions to Guide Instruction

What makes a work of art great? Why do people find the painting "Guernica" by Picasso so compelling? What makes a Frank Lloyd Wright building so remarkable? Why is Aaron Copland's lyrical "Appalachian Spring" such a heralded piece of music? What was it about Walker Evans' photographs that renders his images so memorable? Why do generations keep discovering magic in a novel such as *To Kill A Mockingbird*? How do we explain the appeal of a Mozart opera, an Emily Dickinson poem, a Henry Moore sculpture, a Sergei Eisenstein motion picture, a Billie Holiday recording? How do we account for what makes some artistic works great?

Or, to perhaps ask it another way, "Why should we bother to become acquainted with works such as these?" Certainly, this is an essential question, a question that cuts right to the core of art and what makes some art meaningful, powerful, and enduring. And it's a question that would undoubtedly elicit a variety of possible answers, probably some disagreement, and perhaps even heated passions.

The concept behind Backward Design is to organize instruction first around "big ideas," those central and focusing ideas within a topic that make it worthwhile to study, the core of a unit that provides students with important insights about their world, the essence of learning that students retain long after their days in the classroom are over. The way to get at big ideas, suggest Wiggins and McTighe, is through essential questions.

Most of the questions that confront students in our curriculum are leading questions. Leading questions direct learning toward a set answer and are helpful in making sure that students are clear on key, basic information. But essential questions help students dig deeper into a topic. Organizing a unit around essential questions involves the following process.

Consider what transcendent questions might be imbedded in a topic or unit of study. Why? or So What? are examples of over-arching questions that help students see critical connections or relationships within a topic area. Why, exactly, are we studying this? How can this be applied in the larger world? What couldn't we do if we didn't understand this? What's the "moral of the story"? What is worth remembering, after time has past, about this topic, unit, novel, or experiment?

For example, why should students read the novel, *Lord of the Flies*? Why this book and not another? What will they gain from this experience that will make a difference to them? What are the "big ideas" in this work? What makes this book a classic?

Questions like these help teachers focus on the "point" of instruction. Unlike leading questions, which could help students follow key events of the plot, spot the author's use of symbolism, or clarify characterization, these overarching questions tap into larger ideas that can be accessed during a unit such as a novel study of *Lord of the Flies*.

Next, decide on "topical" essential questions which directly relate to a specific topic or unit of study. For example, essential questions germane to *Lord of the Flies* might include: What does it mean to be civilized? Are modern civilizations more civilized than ancient ones? What is necessary to insure civilized behavior? Do children need to be taught to be civilized? What causes us to lose civilized behavior?

Wiggins and McTighe argue that essential questions like those posed above have a number of critical attributes. *First*, they are arguable; there is no single obvious "right" answer. Such questions ask students to "uncover" ideas, problems, controversies, philosophical positions, or perspectives. *Second*, essential questions often reach across subject boundaries and engender a series of ensuing and related questions that help us reach an understanding. *Third*, these questions often strike right at the heart of a discipline; such as, what can novels tell us? whose version of history is being presented? can we ultimately prove anything in science? and, how do we know what we think we know? *Fourth*, essential questions are also recursive; that is, they naturally reoccur, often many times, during the study of a discipline. First graders, as well as college students, can offer valid aesthetic judgments about what makes a book a great book, for example. *Finally*, essential questions can provide a focus for sifting through the information and details of a unit of study, and they especially encourage student inquiry, discussion, and research. They involve students in personalizing their learning and in developing individual insights into a topic.

Once you have focused a unit on essential questions, design daily activities and assessments that include student processing of these issues. Students may complain that they do not see the point for studying a certain topic or that they won't use any of this "stuff" in their lives. Essential questions can guide students through assignments and help them understand the intent behind a unit of study and perceive lasting value.

For example, essential questions for a history unit on "manifest destiny" and the movement of settlers west on the American continent could include: Why do people move? Do people migrate for the same reasons today that they did in the nineteenth century? Who has the "right" to a particular territory? Who wins and who loses during major population shifts? Questions such as these can help students focus on big ideas as they study the events such as the Oregon Trail, the Mexican War, the California Gold Rush, and the conflicts between settlers and native peoples in the Great Plains.

Activities such as position papers, debates, role playing, and simulations can be especially effective in helping students formulate working answers to these essential questions. For example, strategies such as RAFT, Reading From Different Perspectives, and Point of View Guides all engage students in discovering divergent viewpoints about the shifting of populations during the settlement of our country.

Certainly, leading questions which help students establish key information are an integral part of instruction. But, essential questions take students beyond "getting the facts" and into the realm of why a topic is ultimately worthwhile for study. Students come to realize that knowledge does not necessarily exist for its own sake, but is used to understand important dynamics about the world and human behavior.

Much of our curriculum is geared to telling students "what." Essential questions help students to perceive "why." In addition,

- * students are engaged in critical thinking as an integral part of learning during a unit of study;
- * students begin to expect more than factual information from their learning; they become accustomed to examining topics and issues with more depth;
- * students are encouraged to take an inquisitive and questioning approach to the curriculum, and to develop answers that personalize their learning;
- * learning centered around essential questions is more likely to be remembered over time rather than forgotten after a test has been taken.

Confronting Wrong Knowledge: Misconception Rejections

Misconceptions are a frequent and powerful impediment to student learning in our classrooms. Harvard psychologist Howard Gardner (1991) argues that young children develop naive and erroneous theories about how things are in the world and that, in spite of education to the contrary, they tenaciously adhere to these misunderstandings throughout life. Even some of our most impressive students, Gardner laments, still view much of life through the lens of their "five-year-old" minds. Consider the following classic misconceptions about "how things are:"

It is warmer in the summer because the earth's orbit takes it closer to the sun. Good writers say exactly what they want without editing. Eastern North America was sparsely populated when Europeans began to arrive. People who are dieting should not eat fat. Any fluids you drink will keep you from becoming dehydrated.

Each of the above statements represents a misunderstanding regarding some important concept that influences the way we look at the world. Yet many people, including some who are highly educated, subscribe to some of these misconceptions. Summer's hot days are a function of the angle of the earth on its axis as it orbits the sun. Few writers, even the most talented ones, can write without editing and revision, and some authors struggle for years to get the words just right. The North American seaboard was populated by thriving native cultures, including sophisticated agricultural communities, before diseases carried from Europe decimated them. Fat is an essential dietary component, although some types of fat are more beneficial than others. And many fluids are diuretics—they remove water from your system—so a glass of iced tea is a poor choice on a sweltering day.

Because misunderstandings are so persistent and widespread, it is critical to directly counteract them in teaching. A key component of Backward Design is to directly plan instruction that will challenge student misunderstandings about a topic of study. The following steps can help prepare students for confronting misconceptions they may hold related within a curriculum.

Initiate a discussion about misconceptions by asking students to generate a list of false beliefs that people in past times once accepted. As students work in cooperative groups, they may come up with items such as: the earth is flat, bleeding a sick person will make them healthy, Columbus was the first European to "discover" America, whales are fish, tomatoes are poisonous, and so forth. Some of the false beliefs will likely fall into the realm of superstition (toads cause warts, diseases are caused by evil spirits, etc.).

As groups offer their "historic" misunderstandings, note how it is natural for people to trust their limited experiences and to develop serviceable notions about what they see around them. And emphasize that both teachers and students, like everyone in society, hold mistaken ideas about things which experts in various fields have disproved.

Next, carefully analyze a unit of study to determine whether any common misconceptions may impact whether students will truly internalize key ideas they will be learning. As you identify these potentially harmful misunderstandings, consider ways you can directly counteract them in your instruction and assessment.

As part of this process, be especially alert during activities which elicit student background knowledge to detect important misunderstandings. For example, during a brainstorming activity on the American southwest, student comments reveal that they regard Spanish culture in that region as solely a function of immigration from Mexico. Although a reasonable assumption, this represents a misconception that will need to be specifically addressed during the unit. Spanish culture has been

predominant in the region from Texas to California because this area was part of Mexico until it was annexed by the United States through war in the 1840's.

Confronting "common-sense" explanations is an especially critical need for science teaching. Students may successfully maneuver through a unit on photosynthesis and still retain their rock-bed understanding that "plants get their food from the soil." Instead, using a metaphor that plants are little factories, which take raw materials from the soil as they manufacture their own food, can help to dispel this significant misunderstanding.

Activities, such as anticipation guides, can help focus student attention on "what they know that isn't so." Conceive statements for student small group discussions that directly reflect faulty thinking. For example, a statement such as: "Forest fires are natural disasters for plants and animals" can lead students to understand the vital role that fires play in the ecosystem. A statement such as: "Because the United States is a democracy, the candidate who receives the most popular votes is elected President" helps students realize the widely misunderstood role of the electoral college in determining Presidential elections within a constitutional republic.

During assessment, items which specifically challenge students to verbalize why a misconception is wrong have the potential to replace false notions with real understanding. Provide students with a scenario which represents a common misunderstanding and ask students to explain why this thinking is incorrect.

Gardner maintains that real insights and understandings about our curriculum will be modest unless instruction is systematically geared to rooting out our comfortable, but inaccurate, ideas about how the world is. In addition, zeroing in on misconceptions has other benefits:

- * students become aware that it is a natural human tendency to cling to personal but flawed views of what they see and experience;
- * students are prompted to verbalize how what they are learning contradicts firmly held beliefs or explanations;
- * students are more likely to remember what they have learned because it becomes connected to relevant (albeit naive or erroneous) background knowledge.

Designing Instruction for Understanding

So, how can we teach for true understanding? First, we need to acknowledge that merely introducing ideas and concepts to students is not sufficient. We may cover a body of material, and we may assess the students' short term "mastery" of that material; but, unless we provide ample time for students to really grapple with new learning and truly develop insight into the material, they are unlikely to change their underlying, deeply-held misunderstandings. Classroom strategies that do not allow students to deeply process what they are learning might help achieve higher scores on unit tests, but will not likely create students who have really "learned."

Second, as teachers we need to be highly aggressive in rooting out misconceptions, naive interpretations, and stereotypes as a regular part of classroom routine and assessment. Frontloading activities which elicit students' prior knowledge about a topic prove especially effective in bringing to light misunderstandings, simplistic knowledge, or flawed interpretations. If we don't make it apparent that our teaching is in direct contradiction to beliefs held by many of our students, they may file the new learning into their "know this for the test" mental drawer, but totally overlook the profound implications for their own thinking and perceptions.

Third, we must factor into our teaching the natural human tendency to readily accept ideas and learning that are already consistent with what we think we know. As we read, for example, we

are likely to place far more emphasis on that which confirms our beliefs. Texts which challenge our thinking are more likely to be overlooked or subconsciously discounted. We may especially struggle with grasping and accepting points of view other than our own.

Finally, we need to recognize that a great deal of our daily instruction is intended to undo, to create unlearning. Students don't come to us as empty intellectual vessels, bereft of knowledge. They arrive brimming with intuitive thoughts, ideas, and theories, grounded in what they have observed. Some of what they know can be expanded upon and enhanced, but much of it must be confronted and overruled by new learning. It isn't what they don't know, it's what they know that isn't so.

In *Understanding By Design*, Wiggins and McTighe provide a highly useful blueprint for building a curriculum around essential understandings. The strategies that we use to deliver daily instruction can be an integral part of this broader vision; however, using interactive strategies with our students is not in itself a guarantee that they will be engaged in learning that is substantial and meaningful. The challenge for us as teachers is to insure that our daily classroom strategies lead students toward truly worthwhile learning.

Further Resources:

Gardner, H. (1991) *The Unschooled Mind: How Children Think and How Schools Should Teach*. Harper Collins Basic Books.

Wiggins, G. & McTighe, J. (1998) *Understanding By Design*. Alexandria, Va: ASCD.

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