



CHAPTER TWO

A TAXONOMY OF SIGNIFICANT LEARNING

If learning is regarded not as the acquisition of information, but as a search for meaning and coherence in one's life and, if an emphasis is placed on what is learned and its personal significance to the learner, rather than how much is learned, researchers would gain valuable new insights into both the mechanisms of learning and the relative advantages of teacher-controlled and learner-controlled modes of learning.

—PHILIP CANDY (1991)

Some years ago I was visiting with my doctor during an annual physical, and we started talking about the quality of our country's schools and colleges. As a man concerned about public affairs, he expressed a feeling that seems to be widespread in society at the present time, that "students don't seem to be learning much these days." My response was, "No, they are learning things. They just aren't learning the 'right' things, the things that they need to be learning."

The distinction I was trying to make that day—and the distinction that Candy makes so well in the opening quote—is the difference between a content-centered and a learning-centered approach to teaching. If higher education hopes to craft a more meaningful way of educating students, as advocated by the multiple constituencies cited in the preceding chapter, then college professors will need to find a new and better way of teaching, one that focuses on the *quality* of student learning. How can we begin the process of doing this?

For the past twenty years, I have been working with faculty members as an instructional consultant at the University of Oklahoma to assist them in finding ways to improve their teaching and their students' learning. As we worked at that task, we found ourselves on a journey that seemed to parallel the national effort described in Chapter One: searching for better ways of providing significant learning experiences for our students.

Before long we realized that we needed to find or create a new set of concepts and terms to describe those experiences. We needed a language that could accurately

and fully describe the kind of impact we wanted to have on students' lives. This new language would need to be applicable across a wide range of disciplines and learning situations. It would also have to satisfy the felt needs of the several major constituencies in higher education: faculty members, students, administrators, disciplinary associations, employer groups, and so on.

This chapter describes a new "taxonomy of significant learning" that encompasses a wide range of different kinds of learning. It includes the types of learning that many constituencies (students, faculty, professional associations, commentators on the educational needs of modern society, and so on and on) deem to be significant. It goes on to show how to create course goals based on the taxonomy and describe how the taxonomy reflects the kinds of learning described and advocated in the literature on college teaching. It also points out the paradigm shift embedded in this taxonomy and addresses a number of questions associated with such a fundamental change in perspective.

Beginning the Journey

My own search for better ideas on teaching began a number of years ago when I was waiting in an office on campus one day and a receptionist asked me: "Given all your experience of observing other people's courses, what do you think makes a good course 'good'?" After recovering from the embarrassed realization that I did not have a ready answer for this innocent but profound question, I began working on a reply and eventually developed a list that I capriciously called "Fink's Five Principles of Fine Teaching." The last three items on this list have been modified from time to time, but the first two have always remained at the top of the list. The current list is as follows:

Good courses are courses that. . .

- Challenge students to significant kinds of learning.
- Use active forms of learning.
- Have teachers who *care*—about the subject, their students, and about teaching and learning.
- Have teachers who *interact well* with students.
- Have a good system of feedback, assessment, and grading.

This list simply reflects my view that, if someone's teaching successfully meets these criteria, its impact is going to be good, no matter what else is bad about it—even if a teacher is not a great lecturer or well organized. Conversely, if some-

one's teaching does not meet these five criteria, that teaching is poor, no matter what else is good about it.

The single most important item on this list, in my view, has always been the first one. If students have indeed been challenged to and have achieved something that can meaningfully be called "significant learning," then the learning experience has been good, no matter what else is bad about the course. The bottom line is that significant learning has been achieved. This then leads to the question: What kinds of learning can be said to constitute significant learning?

What Makes Learning Significant?

When teachers face the task of describing what they want students to get out of their course and when they want something that would take them beyond their own thinking, some turn to the well-known taxonomy of educational objectives formulated by Benjamin Bloom and his associates in the 1950s. Although there are in fact three taxonomies (cognitive, affective, and psychomotor), teachers refer to the one in the cognitive domain most frequently (Bloom, 1956). The cognitive taxonomy consists of six kinds of learning arranged in a hierarchical sequence. These are, from the highest to the lowest

- Evaluation
- Synthesis
- Analysis
- Application
- Comprehension
- Knowledge (meaning the ability to recall information)

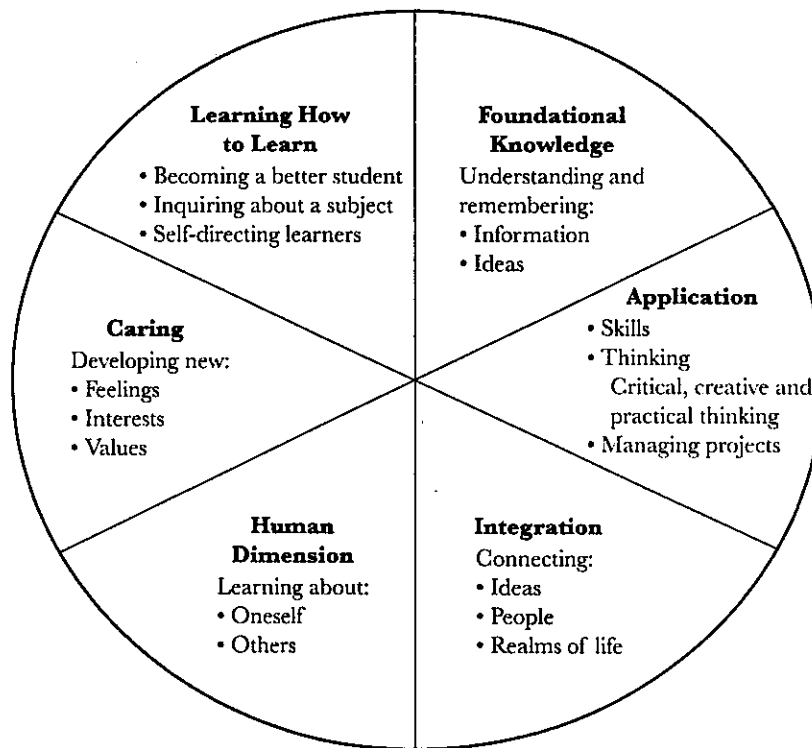
Teachers have used this taxonomy both as a framework for formulating course objectives and as a basis for testing student learning.

There is no question about the value of what Bloom and his associates accomplished by creating this taxonomy. Any model that commands this kind of respect half a century later is extraordinary. However, as noted in Chapter One, individuals and organizations involved in higher education are expressing a need for important kinds of learning that do not emerge easily from the Bloom taxonomy, for example: learning how to learn, leadership and interpersonal skills, ethics, communication skills, character, tolerance, and the ability to adapt to change. My interpretation of the aforementioned statements is that they are expressing a need for *new kinds* of learning, kinds that go well beyond the cognitive domain of Bloom's taxonomy and even beyond cognitive learning itself. This suggests that

the time may have arrived when we need a new and broader taxonomy of significant learning. With an awareness of this need in mind, I have reviewed descriptions of quality teaching and learning and have attempted the task of creating a new taxonomy, one that describes various ways in which learning can be significant and represents my effort to synthesize several decades of conversations with students and teachers on this topic.

In the process of constructing this taxonomy, I was guided by a particular perspective on learning: I defined learning in terms of change. For learning to occur, there has to be some kind of change in the learner. No change, no learning. And significant learning requires that there be some kind of lasting change that is important in terms of the learner's life. With this perspective in mind, I created a taxonomy based on the six kinds of significant learning shown in Figure 2.1.

FIGURE 2.1. TAXONOMY OF SIGNIFICANT LEARNING.



Major Categories in the Taxonomy of Significant Learning

Each category of significant learning contains several more specific kinds of learning that are related in some way and have a distinct value for the learner.

Foundational Knowledge. At the base of most other kinds of learning is the need for students to know something. *Knowing*, as used here, refers to students' ability to understand and remember specific information and ideas. It is important for people today to have some valid basic knowledge, for example, about science, history, literature, geography, and other aspects of their world. They also need to understand major ideas or perspectives, for example, what evolution is (and what it is not), what capitalism is (and is not), and so forth.

Special value: Foundational knowledge provides the *basic understanding* that is necessary for other kinds of learning.

Application. Besides picking up facts and ideas, students often learn how to engage in some new kind of action, which may be intellectual, physical, or social. Learning how to engage in various kinds of thinking (critical, creative, practical) is an important form of application learning. But this category of significant learning also includes developing certain skills (such as communication or playing the piano) or learning how to manage complex projects.

Special value: Application learning allows other kinds of learning to become *useful*.

Integration. When students are able to see and understand the connections between different things, an important kind of learning has occurred. Sometimes they make connections between specific ideas, between whole realms of ideas, between people, or between different realms of life (say, between school and work or between school and leisure life).

Special value: The act of making new connections gives learners a new form of *power*, especially intellectual power.

Human Dimension. When students learn something important about themselves or about others, it enables them to function and interact more effectively. They discover the personal and social implications of what they have learned. What they learn or the way in which they learn sometimes gives students a new understanding of themselves (self-image) or a new vision of what they want to become (self-ideal). At other times, they acquire a better understanding of others: how and why others act the way they do, or how the learner can interact more effectively with others.

Special value: This kind of learning informs students about *the human significance* of what they are learning.

Caring. Sometimes a learning experience changes the degree to which students care about something. This may be reflected in the form of new feelings, interests, or values. Any of these changes means students now care about something to a greater degree than they did before, or in a different way.

Special value: When students care about something, they then have the *energy* they need for learning more about it and making it a part of their lives. Without the energy for learning, nothing significant happens.

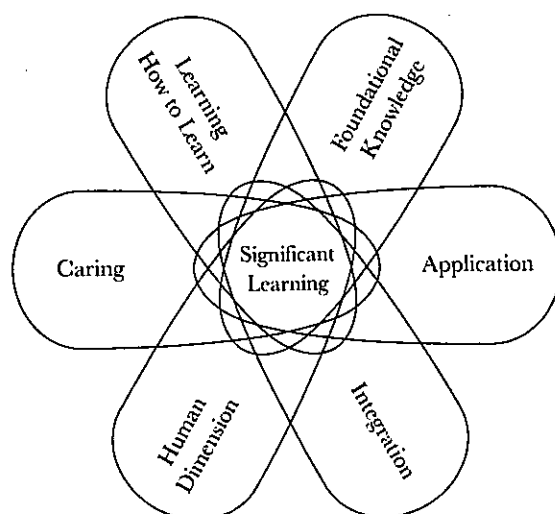
Learning How to Learn. In the course of their studies, students can also learn something about the process of learning itself. They may be learning how to be a better student, how to engage in a particular kind of inquiry (such as the scientific method), or how to become a self-directing learner. All these constitute important forms of learning how to learn.

Special value: This kind of learning enables students to *continue* learning in the future and to do so with *greater effectiveness*.

Interactive Nature of Significant Learning

One important feature of this taxonomy is that it is not hierarchical but rather relational and even interactive. The diagram in Figure 2.2 illustrates the interactive character of this taxonomy. This more dynamic diagram is intended to show that each kind of learning is related to the other kinds of learning and that achieving any one kind of learning simultaneously enhances the possibility of achieving the other kinds of learning as well. Why is this so important?

This interrelation matters to teachers because it means the various kinds of learning are synergistic. And this in turn means that *teaching is no longer a zero-sum game*. That is, teachers don't automatically have to give up one kind of learning to achieve another. Instead, when a teacher finds a way to help students achieve one kind of learning, this can in fact enhance, not decrease, student achievement in the other kinds of learning. For example, if a teacher finds a way to help students learn how to use the information and concepts in a course to solve certain kinds of problems effectively (application), this makes it easier for them to get excited about the value of the subject (caring). Or when students learn how to effectively relate this subject to other ideas and subjects (integration), this makes it easier for students to see the significance of the course material for themselves and for others (human dimension). When a course or learning experience is able to promote all six kinds of learning, one has had a learning experience that can truly be deemed significant.

FIGURE 2.2. THE INTERACTIVE NATURE OF SIGNIFICANT LEARNING.

Formulating Course Goals Around Significant Learning

The taxonomy of significant learning has two major implications for teachers. The first is that the learning goals for a course should include but also go beyond content mastery. Including something besides foundational knowledge will make the learning experience inherently more worthwhile and at the same time make it more interesting for learners. The second is that if teachers use a combination of significant learning goals, it will be possible to create some interaction effects and synergy that greatly enhance the achievement of significant learning by students.

But to enjoy these benefits, teachers need to know how to formulate new course goals around the ideas of significant learning. How does one do that? Chapter Three contributes additional ideas to answering this question, but it's useful to start by looking at a general version of significant learning goals and then at a course-specific version.

General Version

Some teachers like to describe their course goals in general terms; others prefer more specifics. For those who prefer the former approach, Exhibit 2.1 shows a set of course goals that reflect the six kinds of significant learning. Most teachers

EXHIBIT 2.1. GENERAL COURSE GOALS FORMULATED IN TERMS OF SIGNIFICANT LEARNING.

By the end of this course, students will. . .

Understand and remember key concepts, terms, relationships, and so on.

Know how to *use* the content.

Be able to *relate* this subject to other subjects.

Understand the *personal and social implications* of knowing about this subject.

Care about the subject (and about learning more on the subject).

Know *how to keep on learning* about this subject after the course is over.

would find these meaningful and would be delighted if students in their courses achieved these goals.

A generalized form of course goals, such as those in Exhibit 2.1, leaves open the question of what the specific concepts, terms, and relationships will be, what specific uses will be made of the content, and so forth. These will presumably become clear during the course as students work their way through the readings, lectures, application exercises, and other learning activities.

Developing Course-Specific Learning Goals

Other teachers prefer to describe their course goals, even initially, in more specific terms. What might the learning goals look like when formulated in terms of a specific course? To give a quick answer to this question, let me describe the learning goals for a course on world regional geography that I have taught, formulated around the six categories of significant learning.

"After this course is over, students will. . ."

Foundational Knowledge

- Have a mental map of the world and be able to correctly locate major places—countries, mountain ranges, rivers, cities, oceans, and so on.
- Understand major geographic concepts—physical geography, human geography, scale, demographic transition, and so on.

Application

- Be able to find information on and analyze regional problems from a geographic perspective.
- Be able to use an atlas effectively and efficiently.

Integration

- Identify the interactions between geography and other realms of knowledge such as history, politics, economics, social structure, and so on.

Human Dimension

- Be able to identify ways in which one's personal life affects and is affected by interactions with other world regions.
- Be able to intelligently discuss world events with other people and the impact of geography on these events.

Caring

- Be interested in other places of the world and want to continue learning about those places via reading, TV, the Internet, and travel.

Learning How to Learn

- Be able to interpret the geographic significance of new information and ideas acquired in the future.
- Be familiar with a number of popular geography journals and other sources of knowledge about other parts of the world.
- Have some specific ideas about what else it would be desirable to know about other places in the world.

When different professors develop goals for their own courses, those goals will naturally look quite different from my sample. But this initial version nonetheless illustrates what significant learning goals for a specific course might look like. The next chapter, which addresses the initial steps in designing a course, will offer additional examples of how teachers create significant learning goals for specific courses.

Significant Learning and the Literature on College Teaching

One of the attractive features of a taxonomy as broad as this one is that it encompasses and integrates a wide range of literature on desirable kinds of learning. Familiar curricular goals come to life when viewed in relation to the taxonomy. In addition, the new taxonomy can organize and make sense of a broad range of published statements on what students can and should learn at the college level.

General Curricular Goals

The literature on college teaching contains numerous recommendations about what teachers should be teaching and students should be learning. By looking at these in the framework of significant learning, it becomes easier to see both what is distinctively valuable about each one and that none of them capture the whole of significant learning on their own.

Exhibit 2.2 contains a list of several educational goals that have been described in the literature of higher education as desirable for college courses and curricula. These have been sorted into groups, according to the kind of significant learning that each seems to best express.

The next step in understanding the value and meaning of this taxonomy is to relate it even more broadly to the literature on college teaching. People have written extensively about what students should learn and about how to teach so that students learn something significant. One of the tests of any taxonomy is how well it interprets and makes sense out of this literature.

To review this literature, I will start with the most familiar category, foundational knowledge, and work toward the more novel categories in the taxonomy.

First Kind of Significant Learning: Foundational Knowledge. The basic meaning of this kind of learning is *understanding and remembering*. Any sustained effort to learn about any topic, subject, or activity will almost inevitably require students to acquire a basic understanding of particular data, concepts, relationships, and perspectives, as well as the ability to recall this knowledge in the future.

However, some educators have offered important ideas to keep in mind, even when pursuing a basic understanding of a subject. Jerome Bruner is famous for many visionary ideas in education, and one of his important contributions is his belief that all subjects have a certain logic or conceptual structure associated with them (Bruner, 1960, 1966). Hence one of the responsibilities of teachers should be not just to teach factual knowledge about a given subject but also to help students gain a full understanding of that subject's underlying conceptual structure. Only then will students be in a good position to do something worthwhile with their new knowledge. Note that the second part of this argument, doing something with knowledge, refers to what the taxonomy of significant learning calls *application*. Bruner is correct, however, in arguing that a powerful grasp of foundational knowledge will require an in-depth understanding of the conceptual structure of a subject, something more than a large collection of poorly related facts and concepts.

During the last few decades, in part as a result of Bruner's influence but also as a result of rethinking educational ideas, practitioners in a number of disciplines have tried to articulate the key concepts and the conceptual structure of their disciplines.

EXHIBIT 2.2. MAJOR EDUCATIONAL GOALS AND SIGNIFICANT LEARNING.

This exhibit presents examples of the many types of significant learning described and advocated in the general literature on teaching and learning. The examples are categorized according to the specific type of learning they exemplify within the overarching framework of the taxonomy of significant learning.

Learning How to Learn:

How to be a better student: Learning how to engage in self-regulated learning or deep learning

How to inquire and construct knowledge: Learning how to engage in the scientific method, historical method, and other forms of inquiry

How to pursue self-directed or intentional learning: Developing a learning agenda and plan; becoming an intentional learner; becoming skilled in autodidaxy (the ability to direct one's own learning and life); being a reflective practitioner

Caring:

Wanting to be a good student: Wanting to have a high GPA or be an honors student

Becoming excited about a particular activity or subject: For example, developing a keen interest in bird watching, reading history, or listening to music

Developing a commitment to live right: For example, deciding to learn and follow Covey's seven habits of highly effective people

Human Dimension:

Leadership: Learning how to be an effective leader

Ethics, character building: Developing character and living by ethical principles

Self-authorship: Learning how to create and take responsibility for one's own life

Multicultural education: Becoming culturally sensitive in one's interactions with others

Working as a member of a team: Knowing how to contribute to a team

Citizenship: Being a responsible citizen of one's local community, nation state, and other political entity

Serving others (local, national, world): Contributing to the well-being of others at multiple levels of society

Environmental ethics: Having ethical principles in relation to the nonhuman world

Integration:

Interdisciplinary learning: Connecting different disciplines and perspectives

Learning communities: Connecting different people

Learning and living/working: Connecting different realms of life

Application:

Critical thinking: Analyzing and critiquing issues and situations

Practical thinking: Developing problem-solving and decision-making capabilities

Creativity: Creating new ideas, products, and perspectives

Managing complex projects: Being able to coordinate and sequence multiple tasks in a single project

Performance skills: Developing capabilities in such areas as foreign language, communication, operating technology, performing in the fine arts, sports

Foundational Knowledge:

Conceptual understanding: Developing a full understanding of the concepts associated with a subject to a degree that allows explanations, predictions, and so on.

One notable example of this is the recent effort in physics education by David Hestenes and his associates at Arizona State University to develop a clearer statement of the most fundamental concepts in physics (Hestenes, 1999). They have gone on to develop ways of helping students acquire a conceptual understanding of physics rather than just the ability to correctly perform the calculations involved in the usual exercise problems.

The central theme in all this is that almost all kinds of significant learning will be based on, and hence will require students to have, an in-depth understanding of some subject matter. And this is why it has been labeled here as *foundational knowledge*.

Second Kind of Significant Learning: Application. After foundational knowledge, application learning is probably the most common educational goal for many college teachers. They frequently talk about wanting their students to “learn how to *use* knowledge” in some way. However, knowledge can be used in multiple ways, which is why this category of significant learning has multiple meanings. As used here, *application* or using foundational knowledge includes developing particular skills, learning how to manage complex projects, and developing the ability to engage in various kinds of thinking.

Skills. When teachers say they want students to learn how to use some particular knowledge, they are sometimes referring to students’ learning how to develop a skill of some kind, that is, the ability to engage in a particular kind of action. Sometimes this skill has a significant physical component associated with it. For example, anyone who learns how to play the piano must pick up a certain amount of foundational knowledge: notes, scales, harmonies, and so on. But at some point, new pianists must learn how to use their arms, hands, feet, and fingers to make this instrument create music. When they are learning how to do that, they are developing a skill, an ability to engage in a particular kind of action. Other familiar examples of skills include writing, oral communication, using computer programs, and operating laboratory equipment such as microscopes and burners.

Most skills have criteria associated with them that distinguish competent or expert-level performance of these skills from novice-level performance. The goal of any skill-focused learning is to move learners along a continuum in the direction of being able to perform an action at a higher level of competence.

Managing Complex Projects. Another kind of application is the ability to manage complex projects. Like the use of skill, this activity also has criteria associated with high-quality performance. But what distinguishes this activity from other forms of application learning is the complexity of the activity. This complexity requires stu-

dents to learn how to organize and coordinate several tasks as part of one major project.

A good example of a complex project comes from a professor of regional and city planning at the University of Oklahoma who had a course that involved both undergraduate and graduate students. This professor had his students develop ideas on how the city of Los Angeles could beautify a river running through the city and then make an actual proposal to the city to implement the project. This required the students to learn about urban waterways, how to find information on Los Angeles and their particular river, how to use computers to build models and graphics, and then how to engage in the politics, marketing, and public relations required to sell their idea to the city. Part of what made this project distinctive is that the students had to learn how to organize and coordinate many different tasks to successfully complete the whole project.

A modest but perhaps more familiar example of learning to manage complex projects is when professors have students engage in a complex research project. Students have to learn how to organize and coordinate several subtasks to complete the whole project: learning how to focus the topic, finding relevant sources of information, extracting key information and ideas from the literature, analyzing and organizing these into a coherent paper or presentation, and the like. Completing such tasks helps students develop a general ability for managing complex projects.

The General Concept of Thinking. A third and very important kind of application is learning how to think. Few topics have received more attention in the literature on college teaching than this one. Almost every teacher who talks at length about educational goals will eventually say in one way or another, "I want my students to learn how to think." The scholarly literature on this topic is so voluminous that two authors have put together an annotated bibliography on the teaching of thinking (Cassel and Congleton, 1993). However, even a quick review of this literature makes it clear that teachers and writers are often referring to very different things when they use the term *thinking*. This has happened in part because of the complexity of the concept and in part because it is such an attractive term; people use it to describe their favorite kind of learning, whatever that is.

Regardless of which particular view of thinking a teacher holds, it will constitute a form of application learning. To cite one example that I have found particularly attractive, Robert Sternberg (1989) has what he calls the "triarchic" view of thinking, which he uses to help students learn to think more effectively. He sees *thinking* as a general concept and then identifies three distinct subcategories: critical thinking, creative thinking, and practical thinking. My own translation of this view makes the following distinction among these three kinds of thinking. *Critical*

thinking, the term invoked most widely in higher education, has a specific meaning in Sternberg's triarchic view. Here it refers to the process of analyzing and evaluating something; hence criteria play an especially important role. *Creative thinking* occurs when one imagines and creates a new idea, design, or product; in these instances, novelty and "fit with the context" play a key role. *Practical thinking* occurs when a person is learning how to use and apply something, as when trying to solve a problem or make a decision. The product of this kind of thinking is a solution or a decision, and the effectiveness of the solution or decision is paramount. The use of case studies in business schools is a good example of promoting practical thinking; students are generally learning how to solve problems and make decisions.

To help teachers see the classroom meaning of this view of thinking, Sternberg created a list of questions that illustrates each of the three kinds of thinking, for six different kinds of courses. (See Exhibit 2.3.) Again, what this list shows is that, unlike many writers, Sternberg uses "thinking" rather than "critical thinking" as the appropriate label for the general concept; *critical thinking* is still important, but it is only one of three important kinds of thinking. I find this distinction helpful when visiting with teachers to talk about what it is they specifically want their students to learn. What are some familiar examples of course goals that reflect these three kinds of thinking?

Critical Thinking. When college teachers want their students to learn how to analyze and evaluate something, they have a critical thinking goal. Literature teachers want their students to "analyze and evaluate" when they ask students to interpret a novel. They want students to analyze the novel in terms of various concepts (plot development, the portrayal of characters, the creation of dramatic tension, and so on); whole-class discussions are then frequently used for students to learn how to assess different interpretations. Science teachers want their students to analyze when they ask them to use previously explained concepts (such as energy conservation or plate tectonics) to explain (or to predict) what is happening (or will happen) to certain phenomena under particular circumstances. Then they ask the students individually or collectively to assess those explanations and predictions.

In these and similar teaching situations, teachers are wanting their students to engage in and improve their ability to think critically. To do this, students need to have the relevant conceptual understanding, but they also need criteria for assessing the quality of interpretations, explanations, and predictions.

Creative Thinking. People who teach in the humanities are quite accustomed to encouraging their students to engage in creative thinking. In applied courses in the

**EXHIBIT 2.3. QUESTIONS DESIGNED
TO PROMPT THREE KINDS OF THINKING.**

Field	Critical Thinking	Creative Thinking	Practical Thinking
Psychology	Compare Freud's theory of dreaming to Crick's.	Design an experiment to test a theory of dreaming.	What are the implications of Freud's theory of dreaming for your own life?
Biology	Evaluate the validity of the bacterial theory of ulcers.	Design an experiment to test the bacterial theory of ulcers.	How would the bacterial theory of ulcers change conventional treatment regimens?
Literature	In what ways were Catherine Earnshaw and Daisy Miller similar?	Write an alternative ending to <i>Wuthering Heights</i> , uniting Catherine and Heathcliff in life.	Why are lovers sometimes cruel to each other and what can we do about it?
History	How did events in post-WWI Germany lead to the rise of Nazism?	How might Truman have encouraged the surrender of Japan without A-bombing Hiroshima?	What lessons does Nazism hold for events in Bosnia today?
Mathematics	How is this mathematical proof flawed?	Prove [a given proposition] How might catastrophe theory be applied to psychology?	How is trigonometry applied to the construction of bridges?
Art	Compare and contrast how Rembrandt and Van Gogh used light in [specific paintings].	Draw a beam of light.	How could we reproduce the lighting in this painting in an actual room?

Source: Material supplied by Robert J. Sternberg, Psychology Department, Yale University. Used by permission.

humanities, teachers help their students find new forms and styles for expressing themselves in painting, writing, music, and other media. Even in nonapplied courses, teachers are often trying to get their students to find new interpretations of existing works. When this happens, they are encouraging their students to engage in creative thinking.

Creative thinking is also found in the social science and natural science areas. When teachers want their students to “think outside the box,” to find new ways of answering questions, to develop new perspectives on the phenomena being studied, or to devise new solutions to old problems, they are urging their students to engage in creative thinking. The common element in creative thinking is helping students learn how to create new ideas, new ways of doing things.

Practical Thinking. A third kind of thinking is practical thinking, which means students are learning how to answer questions, make decisions, and solve problems. This is what we are doing when we ask students to engage in problem-solving or decision-making exercises. When teachers in business, engineering, or education, for example, say to their students, “Here is a problem. How would you solve it?” they are asking students to engage in practical thinking. When teachers say, “Here is a common situation where you have these choices. What choice or decision should you make?” they are again asking students to engage in practical thinking.

Whether we use hypothetical, simulated, or real problems and questions, we are asking students to learn how to engage in effective practical thinking, an ability that will have extensive value in their personal, social, and work life.

And that is the key value of all application learning. It provides students with a kind of learning that will be useful. Learning particular skills, learning how to manage complex projects, and learning how to engage in critical, creative, and practical thinking—these all allow students to take other kinds of learning and make them useful.

Third Kind of Significant Learning: Integration. The third realm of significant learning is integration. This is where students learn how to connect and relate various things to each other. Of the many examples that might be mentioned, I would like to note three major kinds of connections that many educators have emphasized.

Interdisciplinary Learning. Teachers have been interested for a long time in the goal of interdisciplinary learning. While recognizing the obvious need to continue learning about individual disciplines, a number of scholars have noted that most of the world’s big problems are bigger than any single discipline (for example, see Davis, 1995). Therefore the world needs people who have learned how to look

at problems from the perspectives of two or more disciplines and who can interact effectively with individuals who represent different perspectives and disciplines.

Sometimes interdisciplinary teaching is accomplished by one teacher in one course who presents the perspectives of two or more disciplines to the class. At other times, educators use team teaching, coordinated courses, interdisciplinary programs, or even the curriculum of a whole college to achieve interdisciplinary learning (Klein and Doty, 1994; Klein and Newell, 1996). Evergreen State University in Washington is one example of such a college; another is the College of Liberal Studies at the University of Oklahoma. The common element in all of these efforts is the goal of helping students learn how to connect and integrate different kinds of information, perspectives, and methods of inquiry and analysis—all in order to develop a more holistic understanding of a problem or issue.

Learning Communities. Another closely related activity that has gathered strong interest in the 1990s is the creation of learning communities. This activity also has the general goal of helping students learn how to integrate different perspectives but focuses on the strategy of connecting diverse people as well as diverse disciplines (Gabelnick and others, 1990; Shapiro and Levine, 1999).

These programs search for ways of creating new kinds of interactions between faculty, students, staff, and sometimes off-campus people. This is done in a variety of ways:

- Creating different residential arrangements
- Linking courses so that students take a set of courses together, often with team teaching as a corollary
- Bringing in outside people to do something with students on campus or sending students off-campus to work with people in other contexts and environments

Parker Palmer, in his enormously successful book *The Courage to Teach* (1998), also recommended and described another way of creating learning communities. Speaking partly allegorically and partly realistically, he urged educators to put the subject “in the center,” and for the teacher and students to sit in a circle around the subject and try to learn about it together. The intent is to create a new kind of relationship between the teacher, the students, and the subject.

The theme that occurs repeatedly in the discussion of these ventures is the desirability of breaking down walls and overcoming the isolation of students and subjects from each other. That is, they are seeking to create hitherto absent connections and integration between different people and different ideas.

Connecting Academic Work with Other Areas of Life. A third closely related realm of educational effort has been in the direction of connecting what students learn in

their academic work with other areas of their lives. These other areas often include students' work but also extend to students' personal and social lives.

When teachers have students interview older family members to learn via oral history, the students are learning how to gather information about history from a new source. But they are also developing a connection between the history they are studying in class and their own family life. When professors in pre-professional programs have students do internships or work in real-life settings while taking courses, the curriculum is intended to help students build connections between what they are learning in class and what they are or will be doing in the workplace. When professors create service learning opportunities, students are encouraged to find and create connections between what they are learning in class and the activities of the larger community in which they live. When teachers have students keep a journal, noting events in their personal lives that reflect whatever subject the students are studying, the teacher is trying to help students build connections between what they are learning in class and what is happening in other parts of their lives.

Fourth Kind of Significant Learning: Human Dimension. The fourth kind of significant learning addresses the important relationships and interactions we all have with ourselves and with others. When we learn how to fulfill these relationships in positive ways and how to honor and advance those relationships, we learn something very important. College students frequently report that learning about themselves and about others is among the most significant experiences they have during college. It is also clear that this is something very different from learning about "people out there," and the difference lies in the existence of a real relationship.

Learning About Self. When we learn about our Self, we might learn something that helps us understand who we are at the present time; this kind of learning changes or informs our self-image. At other times, we might learn something new about the person we want to become; this gives us a new self-ideal. Both are important and either may happen intentionally or as a by-product of the formal aspects of our education.

As an example of this kind of learning, imagine a new, first-generation college student taking a challenging chemistry or math class and thinking: "This material is difficult. But if I study smart and study hard, I find that I can do it. That is, I can understand challenging subjects and get good grades. I guess I am capable of doing college-level work." A student such as this can have doubts and uncertainty about being the kind of person who is capable of succeeding in college. But if the efforts go well, the student can develop a new self-image—as a new, more competent kind of person.

A student I interviewed some years ago told the story of how he was enrolled in a course on urban geography and how the teacher had the class working on an authentic project for the local city. One day the student was walking across campus with some maps under his arm and ran into a group of friends. They saw the maps, asked him what he was doing, and he told them he was working on a project to assess a new transportation system for the city. The friends were impressed. As a result of this exchange, this student felt he had become important in the eyes of his friends and therefore more worthwhile in his own eyes. But he also realized that he liked feeling this way, that is, feeling like a professional person. Consequently he decided that he wanted to become a professional city planner. What happened in this situation was that this person not only acquired a new self-image but also a new *self-ideal*, that is, a new image of the kind of person he wanted to become.

Journey Toward Self-Authorship. Marcia Baxter Magolda (1992, 1999, 2001) postulates an educational goal for all college teachers that is a powerful and valid example of this kind of significant learning: assisting students on their journey toward self-authorship. She is conducting a longitudinal study of a hundred students who began college in 1986 and has now followed these students into their early thirties. One of her conclusions is that it is possible for college teachers to do more than we are currently doing to assist students along on their journey toward being able to internally define their own beliefs, identity, and relationships, that is, toward self-authorship.

Underlying her recommendations are the beliefs that knowledge is complex and socially constructed and that Self is central to knowledge construction. Students must develop a strong sense of their own identity if they are going to take responsibility for constructing their own knowledge and the other aspects of their lives, that is, if they are going to engage in self-authorship.

Learning About Others. Sometimes our educational experiences enable us to better understand and interact with other people. For example, on my campus several professors are now using small groups with team-based learning in their classes. In one of these classes, a student team included an East Asian student. The group soon realized that this student was getting high scores on his individual tests but was often not volunteering his answers when they took the same test as a group. When they asked why he didn't speak up and share his answers more freely, he replied: "In my culture it is not polite to tell others they are wrong." After pondering this situation awhile, the rest of the group decided on a new strategy when it came time to take the group test. They would start their discussions by asking this student what his answer was and then go on to see what the rest of the group

thought was correct. That way he wasn't forced into telling anyone they were wrong, yet the group was able to find out what his answer was. The students in this group learned a very important lesson about interacting with people from a different culture and specifically about people in cultures where saving face is very important.

A second example comes from a freshman orientation-to-college class I taught some years ago. That year I wanted to do something to counter the strong attitude of "me-ism" that I saw in that group of students. So I made arrangements for the class to do some community service. On this particular occasion we served lunch in a community kitchen called "Food for Friends." When the students later wrote about the experience, many commented on how they came to see poor people in a different light. They could see that these people were struggling hard to maintain their self-respect. And that experience in turn changed the way these students saw and interacted subsequently with other people in less fortunate circumstances than themselves.

In both these situations, students were acquiring a new understanding of and an ability to interact with others, that is, they were learning about the human dimension in learning and in life.

A Broader Concept of Others. Usually we are referring to other people when we speak of learning about Others. But sometimes *Others* extends to more than people.

I have been educated in very important ways by the writings and videotapes of Monty Roberts, the original "horse whisperer" (1997, 2001). As a young man he spent time observing wild horses in the open lands of Nevada and, as a result, developed an understanding of how they behaved and communicated with each other. Based on that, he created procedures for communicating and interacting with horses in a way that allows humans and horses to "join up" and do things together collaboratively rather than violently and forcefully. In this case, Monty Roberts (and other humans who have learned from him) has learned how to understand and interact with others, only in this case the Others are horses. In a similar vein, Native Americans sometimes speak of parts of nature as being significant Others in their lives.

Some people develop a similar, special kind of relationship with nonanimate Others, that is, with machines and technology. People who have read Charles Lindbergh's writings about his adventures with airplanes often conclude that he did not just operate airplanes, he "worked with them." Even the titles of his books reflect this relationship: *We* (1927) and *The Spirit of St. Louis* (1953). He had a relationship with this particular kind of technology, he understood it and cared for it deeply, and as a result seemed to be able to do things together with airplanes that others could not do. Today we often find people who have a similar kind of

relationship with cars or computers. Again, these individuals have learned how to “understand and interact” with others, only in these cases the Other is a form of technology.

Human Dimension of Learning and Emotional Intelligence. The kind of learning I am referring to under the label of the human dimension of learning is similar to emotional intelligence as described by Daniel Goleman (1995, 1998). He has identified several different competences having to do with oneself (Personal Competence) and one’s interactions with others (Social Competence):

Personal Competence:

- *Self-Awareness:* Knowing one’s internal states, preferences, resources, and intuitions
- *Self-Regulation:* Managing one’s internal states, impulses, and resources
- *Motivation:* Emotional tendencies that guide or facilitate reaching goals

Social Competence:

- *Empathy:* Awareness of other’s feelings, needs, and concerns
- *Social Skills:* Adeptness at inducing desirable responses in others

Source: Goleman, 1998, Table 1, pp. 26–27.

In essence Goleman is saying we must develop an understanding of ourselves and others, emotionally as well as intellectually; then we can learn how to direct our own activities and our interactions with others successfully. As he has documented so thoroughly, this kind of learning is extremely important for the quality of our personal lives as well as for our working lives.

Reciprocity of Learning About Self and Others. Once I started looking for examples of the human dimension in learning, I soon discovered a relationship that is extremely helpful to teachers: when one learns about one’s Self, one almost inevitably learns about Others, and vice versa. This means that if teachers can work one kind of learning into their course, they will likely achieve both.

This relationship is found in several contexts. Teachers involved in minority cultural education have learned that students will learn about both their own ethnic group and other ethnic minorities at the same time, regardless of whether the course or curricular program primarily focuses on one or the other topic. Similarly, when students in a literature course read about characters in a novel, they often identify with and begin to relate to particular individuals in the story, thereby

developing a fuller understanding of themselves while at the same time learning how to understand others.

One can also see this reciprocity in the list of major educational goals shown back in Exhibit 2.2: building character, learning how to interact with people different from oneself (multicultural insights), leadership, ethics (which may be personal, social, professional, or environmental), learning how to work effectively as a member of a team, citizenship, serving others, international awareness, and the rest. Some of these are focused primarily on learning about one's Self, others more on understanding Others. But essentially all of these involve learning about both, that is, developing a Self that is capable of interacting with Others in a more effective and productive way.

The lesson of this point is clear: Help students learn about Self and they will likely learn about Others, and vice versa.

Present in All Parts of the Curriculum? Some readers might wonder whether the human dimension aspect of significant learning is applicable to the natural sciences as well as the humanities and social sciences. To explore this question, I asked a physics teacher whether the human dimension kind of learning was relevant in his courses. After thinking a bit on the question, he decided that, yes, it was. He wants students to understand that the major figures in physics, as in all of science, are much like the students themselves. They all have very different personalities; some are noble, some are vain. Some gladly share their ideas and the results of their research with others; others are secretive and jealous of their work. Most have a strong passion, either about the awesome nature of the physical world or about research. This teacher's response suggests that this form of significant learning is applicable in all or almost all disciplines.

Fifth Kind of Significant Learning: Caring. The fifth kind of significant learning is caring. When I conduct workshops for faculty members on designing courses and significant learning, I often start by asking them to describe the most important things they would like students to get out of their courses. One of their most frequent answers is, "I want my students to get excited about. . . ." Sometimes the teachers want their students to get excited about the subject matter—"I want students to get excited about history." At other times the focus is on getting excited about learning as an activity—"I want students to be *curious*," or "I want them to be excited about doing research on [whatever]." Either way, what these teachers want is for their students to care more deeply about something, that is, to value something differently.

Caring as a Change in Feelings, Interests, or Values. When I talk with students about how they feel about a particular course (or subject) or with teachers about what kind of af-

fective responses they would like to see in their students, they often respond with the following kinds of comments (phrased in terms of what students might say):

- I *enjoy* coming to this class. (Any course)
- I *like* looking through microscopes. (Biology)
- I find it *fascinating* to learn about why people do what they do. (Psychology, sociology)

Such statements indicate students have developed certain feelings associated with a particular subject or learning experiences (such as a course), that certain interests have emerged, and that various values have become important for them. Whenever any of these happen, students have come to care differently about something, and when students care, they have a different affective response.

The Focus of the Caring. When thinking about caring as an educational goal, it is important to remember that students can come to care about any of several possible foci for learning. As a result of their learning experiences, students might care more or differently about. . . .

- The *phenomena* studied: They may find a new interest in literature, history, birds, weather, rocks. . . .
- The *ideas* studied: They may become more curious about the perspectives through which geographers or historians study the world, the implications of the theory of relativity, the power of the theory of evolution to explain biological phenomena, the widespread insights offered by a feminist perspective on events. . . .
- Their own *Self*: "Maybe I have the potential for doing exciting things in life, more than I realized, or to become the kind of person I want to be."
- The *Others* they encounter in the class or the study: Students may find that people different from themselves—in terms of age, gender, ethnicity, religion, nationality, or whatever—are good people and that the process of understanding and interacting with them can be an exciting and enriching experience.
- The process of *learning* itself: When students start to care about learning and want to learn, either in general or about particular things, then truly powerful things can happen educationally. Then students not only care about phenomena, ideas, and the like, they also *care about learning about* them.

Sixth Kind of Significant Learning: Learning How to Learn. The sixth general kind of significant learning is that of helping students learn how to learn. This is an educational goal that has been attractive to teachers for a long time. Like valuing and thinking, this goal holds out the promise of being particularly effective in

enabling other kinds of learning. If we can help people learn how to learn—both during the course and after the course is over—learners will be capable of continuing their learning for the rest of their lives, a truly attractive prospect.

Historical changes have also made this kind of learning particularly important. The twentieth century saw an explosion of knowledge in which the volume of ideas and information about virtually every topic and subject grew exponentially year after year, and that trend continues unabated. Students and teachers are both painfully aware of the educational implications of this explosion. Students buy textbooks that are larger and larger every year; teachers see more and more material they have to cover. As educators, the only strategy that offers any hope of dealing with this situation is to identify the fundamental knowledge for a given subject, make sure that students know that, and then teach them how to keep on learning after the course is over.

If one accepts this view, that learning how to learn is extremely important, what does this mean and how should we do it? Unfortunately the very popularity of the phrase “learning how to learn” has also led to a voluminous body of literature on this topic that can be confusing. This has happened because different people mean different things when they use this phrase. After reviewing the literature on this subject, I have concluded that scholars and teachers have three different sets of meanings for the idea of “learning how to learn”:

- Learning how to be a better student
- Learning how to inquire and construct knowledge
- Learning how to be a self-directing learner

Each of these three meanings of learning how to learn is valid and distinct from the other two. And each one leads to different recommendations for teachers. Hence it is important to review the meaning of each of the three forms of “learning how to learn.”

Learning How to Be a Better Student. A number of educational efforts have been initiated over the years, especially since the 1980s, aimed at helping students learn how to be more effective students.

The Freshman Year Experience started by John Gardner at the University of South Carolina in the early 1980s is a prime example of this. He and now others have written books (for example, Gardner and Jewler, 1999; Ellis, 2000) and sponsored programs intended to help beginning college students learn, among other things, how to read for better understanding, take notes in lectures, take tests, manage their time and attention, and handle a number of other life tasks during this

major transition year. When successful, these programs allow students to learn what might be called the fundamentals of learning how to learn.

More recently several cognitive psychologists have developed the idea of "Self-Regulated Learning" (Pintrich, 1995; Schunk and Zimmerman, 1998; Zimmerman and Schunk, 1989). This is aimed at helping students learn how to regulate three dimensions of their learning: their observable *behavior*, their *motivation* and *affect*, and their *cognition* (Pintrich, 1995, p. 5). Although this is potentially applicable to the learning activities of people of any age and in any situation, the primary focus of the research and application effort has been with college students (Pintrich, 1994).

A similar effort has originated in Europe, starting with research in the late 1970s and becoming increasingly active and visible worldwide in the 1990s. It is concerned with "deep learning," which refers to students' orientation to learning (Marton, Hounsell, and Entwistle, 1997; Gibbs, 1992, 1993). After working with teachers who tried to promote more deep learning among their students, Gibbs has suggested that it is possible to move students toward a deeper approach to learning by doing the following (Gibbs, personal correspondence with the author, 1999):

- Develop their underlying concept of learning or of knowledge itself.
- Develop metacognitive *awareness*, so that they recognize that a deep approach is required, and metacognitive *control*, so that they can make appropriate "meaning making" moves.
- Provide the space and freedom to have time to explore personal interests.
- Make assessment demands explicit so that students understand that only full understanding will be acceptable as a learning outcome.
- Change teaching methods to make learning more active and interactive.

There is a feeling among this group (which is justified in my view) that simply training students in study skills will not have the same effect as changing their orientation to learning along the lines Gibbs lists.

Again, all three of these educational initiatives have the intent of helping college students learn what they need to learn in order to be more effective students. And this is one valid meaning of "learning how to learn."

Inquiring and Constructing Knowledge in Specific Ways. A second general meaning of "learning how to learn" is helping students learn how to add to their own knowledge in ways that are specific to particular domains of knowledge, such as science, history, literature, and so forth. The nature of knowledge in each of these domains is different, and therefore how one adds to that knowledge, whether publicly or

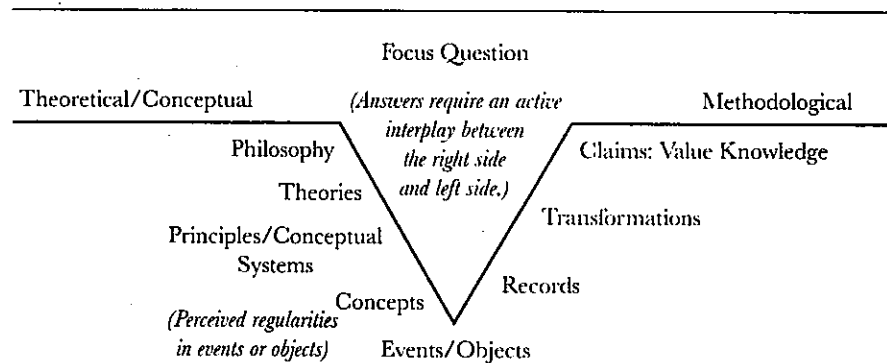
personally, is also distinct. Educationally that means we need to help students learn what those differences are and how to at least continue adding to their own personal knowledge in each domain.

Science educators have supported the concepts of "inquiry teaching" and "inquiry learning" for some time. Much of this is based on the argument that science education should not only teach the results of other people's inquiry but should teach how scientific inquiry works (Schwab, 1962; Thelen, 1960). When teachers make a serious effort to respond to this challenge, they search for ways of helping students learn how to formulate questions and then how to seek information that will allow them to answer those questions.

In a more general form, this can lead into extended efforts to help students learn about canonical and innovative research procedures (for example, Barzun and Graff, 1992) in science (for example, Gower, 1997) and in other fields such as history with well-established research procedures (for example, Collingwood, 1993).

Novak and Gowin extended this form of learning how to learn beyond simply learning about research procedures to the construction of meaning and knowledge. In the preface of their book *Learning How to Learn*, they state that in their view the goal of education is not to produce a "change in behavior" but to produce a "change in the meaning of experience" (Novak and Gowin, 1984, p. xi). This led them to search for ways to help learners "reflect upon their experiences and to construct new, more powerful meanings." They offer two primary ways of doing this. The first is the "Vee" diagram (see Figure 2.3).

FIGURE 2.3. "KNOWLEDGE VEE" DIAGRAM.



Source: Novak and Gowin, 1984, p. 3. Reprinted with permission of Cambridge University Press.

Based on the idea that any claim to knowledge has two dimensions, the theoretical (or conceptual) and the methodological, this diagram stresses the need to alternate back and forth between these two dimensions in an escalating search for "knowledge" or "knowledge claims." Novak and Gowin argue that when students learn how to construct knowledge on their own, their efforts lead to meaningful learning rather than rote learning (1984, pp. 7-9).

Their second way of helping students learn how to construct knowledge is by using "Concept Mapping" (Novak and Gowin, 1984, chapter 2; Novak, 1998). This is a technique in which teachers ask students to take the various concepts they have studied in a unit or course and then create a map or diagram showing the relationships among the concepts. Doing this prompts students to make sense of what they have learned, to see how other people might make a different sense of the same concepts, and to link new concepts to their preexisting understanding of the general topic.

Helping students learn how to ask and answer questions and then incorporate any resulting new knowledge into their existing knowledge is a second valid meaning of "learning how to learn."

Self-Directing Learners. The third meaning of learning how to learn involves helping students become "self-directing learners." (Note: The traditional term for this educational goal is "self-directed learning," but I prefer the more active and personal meaning implied by referring to the learners rather than the learning that takes place.)

In 1975 Malcolm Knowles laid the conceptual and theoretical groundwork for much of the research on this topic. In his view, learning how to learn involves two general steps: diagnosing one's own needs for learning and designing a learning plan (pp. 11-13).

Taking note of Allen Tough's research findings (1979) that adults learn on their own—all the time—Brookfield (1985) uses those observations to argue that teachers therefore need to be "facilitators of learning" rather than "transmitters of knowledge." In separate chapters in this same book, which is edited by Brookfield, he and Jack Mezirow (1985) both comment on the need for critical reflection by the learner. The adult, self-directing learner needs to consider multiple and alternative ways of understanding the meaning of each experience, and the key to this is *critical reflection*.

Phil Candy, in 1991, published what remains the most comprehensive review of self-directed learning to date. He notes the distinction between learning how to learn as a goal and as a method, and then takes this one step further by indicating how the two apply in life as well as in classroom learning. The relationships among these can be illustrated in the following way:

Self-Directed Learning as a

	<i>Goal</i>	<i>Method</i>
Use in life:	Personal autonomy	Autodidaxy
Use in the student role:	Self-managed learning	Learner-controlled activities

One of the reasons Candy emphasized these distinctions was that he wanted to note that “learner-controlled activities” were *not* the same thing as *autodidaxy*, which means knowing how to learn what one needs to learn in life. Many teachers give students an assignment to select a topic, do an independent study of it, and then report back to the class—in hopes that this will promote self-directed learning. And it does . . . but only in a limited way. According to Candy’s analysis, this exercise only engages self-directed learning as a method of learning and only within the student role. Without the necessary accompaniment of critical reflection on the process, it does not serve as a major thrust toward the goal of “self-managed learning.” And without linking this whole process to the larger process of engaging the student in the question—“What should I be learning beyond this topic, and why, and how?”—the learner-controlled activity does not lead to an enhanced capability to engage in autodidaxy for the purpose of enhancing personal autonomy in life. What can a teacher do to promote a stronger, fuller kind of self-directed learning? Candy offers the following suggestions (in chapter 11):

- Make use of learners’ existing knowledge structure.
- Encourage deep-level learning.
- Increase questioning by the learners.
- Develop their critical thinking capabilities.
- Enhance their reading skills.
- Enhance their comprehensive monitoring (of their own learning).

For readers interested in further exploration of this important version of learning how to learn, I recommend three additional resources. Gerald Grow (1991) suggests that learners are often not ready initially for a mature kind of self-direction of their own learning; they may need to make progress toward this goal by going through a series of four stages: dependent, interested, involved, and self-directed. In each stage, the role of the teacher changes significantly. Maria Martinez (1998) labels this form of learning as “Intentional Learning.” She uses this concept to develop ideas on what students have to learn to become intentional learners and describes four kinds of learners that will be recognizable to most teachers: resistant learners, conforming learners, performing learners, and intentional learners. And finally Donald Schön (1983, 1987) has persuasively argued

that professional schools need to break down the separation between studying the principles of good practice and allowing students to apply them. In his view, good professionals are reflective practitioners, meaning they reflect on what they are doing *while* they are doing it, and college students in professional schools need a curriculum that allows and supports them in learning how to do both these tasks simultaneously.

Paradigm Shift

Now that I've described the multiple kinds of learning envisioned by this new taxonomy of learning, it's useful to step back and examine the implications of one very important feature. This taxonomy represents a major shift in the way we think about teaching and learning. In higher education most teachers still teach from what I would call a content-centered paradigm. In this paradigm, teachers respond to the question of what students should learn by describing the topics or content that will be included in the course:

Topics: A, B, C, D. . . .

In contrast, the taxonomy of significant learning is a learning-centered paradigm. In this paradigm, teachers respond to the question of what students should learn by describing different kinds of learning:

Learning How to Learn

Caring

Human Dimension

Integration

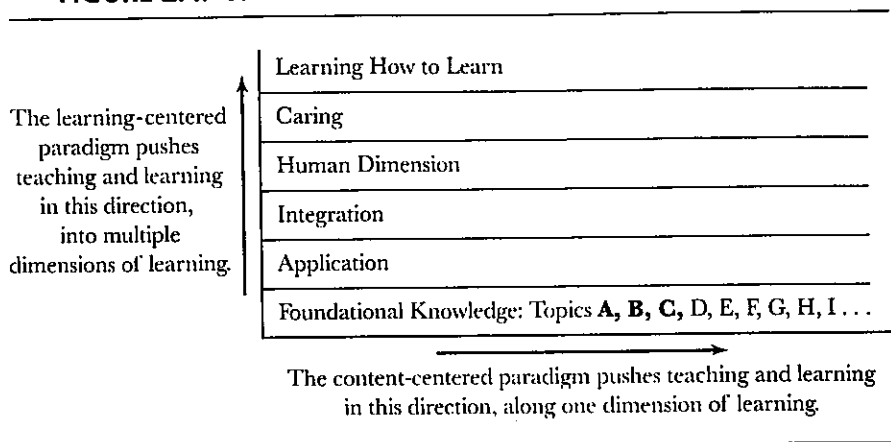
Application

Foundational Knowledge

These two paradigms operate in very different ways. Under the content-centered paradigm, teachers are always being challenged by the question of how much they can cover in the time available. The continuous publication of new research drives a felt need to cover more and more topics in more and more detail; this is clearly reflected in the ever-growing size of textbooks. This leaves the teacher feeling a need to not only cover the traditional topics—A, B, and C—but to add topics D, E, F, and even more if possible.

The learning-centered paradigm pushes teachers in a very different direction. As shown in Figure 2.4, it includes attention to important content but drives teachers to incorporate new kinds of learning (rather than new content):

FIGURE 2.4. THE EFFECTS OF TWO DIFFERENT PARADIGMS.



Now that it's clear there are in fact two different ways of looking at teaching and learning, on what grounds should we choose one over the other? To me, the learning-centered paradigm is the better choice. One reason relates to student learning, the other to faculty needs.

The Need for a Long-Term View of Learning. One of the concerns I often hear from teachers pertains to the ever-growing body of knowledge that characterizes essentially all fields of study. When I present this taxonomy, teachers frequently respond skeptically with: "But I can't cover all the content I need to cover now, and you are telling me I need to spend time on whole new kinds of learning as well?!!!"

I respond to this issue by asking teachers to face the facts. Are they currently covering everything that students will ever need to know about the subject of their courses? They always answer, "Of course not." No one can, and the situation is getting worse. What then are our options in dealing with this dilemma? One option is talk faster and faster each year; this is clearly a simplistic response that is neither effective nor attractive. Furthermore, the research described in Chapter One suggests that cramming more and more material into a course does not lead to learning that lasts. What else can we do?

My own belief is that the only viable option is to take a long-term view of learning. This means we need to identify the most important topics in our courses and then simultaneously promote multiple kinds of learning as a way of increasing the likelihood that students will keep on learning after the course is over.

Consider the two options. If we include lots of content but students end up neither caring about the subject nor learning how to keep on learning, what are

the chances that students will either retain what they have learned or make the effort to keep on learning? The evidence from research and from the widespread faculty observation that students do not currently retain what they learn—even from one course to another—suggests that this is not the option we want.

On the other hand, if students learn how to apply the content, can see how it connects with other knowledge, understand the human implications of what they have learned, and come to care about the subject and about learning how to keep on learning, it seems much likelier that they will both retain what they have learned and continue to enlarge their knowledge after the course is over. Hence, if we take a long-term view of student learning, attending to significant kinds of learning seems like the right choice to make.

Significant Learning and Faculty Dreams. The second reason for choosing the learning-centered paradigm relates to teachers. In Chapter One I describe the responses of faculty when I ask them to dream about what they would really like for students to get out of their courses. They have consistently responded by describing exciting kinds of learning. Do these dreams reflect the content-centered or the learning-centered paradigm? Exhibit 2.4 shows the relationship between faculty dreams and the taxonomy of significant learning. This list takes all of the faculty dreams for student learning described in Chapter One and indicates the kind(s) of significant learning each one exemplifies.

My conclusion—drawn from the close relationship between the taxonomy of significant learning and the list of faculty dreams—is that choosing the learning-centered paradigm will allow faculty to come much closer to realizing their own deep dreams for student learning than will the content-centered paradigm.

Does the Learning-Centered Paradigm Abandon Content? Sometimes faculty feel a shock at having to think about student learning in such a different way. This shock prompts them to wonder whether we have abandoned their original goal of communicating the content of a course in the process of widening the scope of the course to include other desirable kinds of student learning.

My answer to this is, “No, we have not abandoned course content.” We have simply given it a new name, foundational knowledge, and then wrapped several other important kinds of learning around it. The other kinds of significant learning still require students to acquire new information and ideas about the subject being studied. But rather than being the sole purpose of the course, “acquiring new knowledge of the content” becomes the basis for achieving several other kinds of learning—learning how to use the content and how to integrate it with other realms of knowledge, understanding its personal and social implications, and so forth.

EXHIBIT 2.4. FACULTY DREAMS AND SIGNIFICANT LEARNING.

"My dream is that students in my courses will. . . ."

- | | |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------------------------|
| <ul style="list-style-type: none"> • Be ready to engage in life-long learning. • Value continuous improvement. | } = Learning how to learn |
| <ul style="list-style-type: none"> • Develop a deep curiosity. • Experience the joy of learning. | } = Caring |
| <ul style="list-style-type: none"> • See the connections between themselves and their own beliefs, values, and actions, and those of others. • Think about problems and issues in integrated ways, rather than in separated and compartmentalized ways. Students will see connections between multiple perspectives. | } = Integration |
| <ul style="list-style-type: none"> • Take pride in what they have done and can accomplish in whatever discipline or line of work they choose. • See the importance of community building, both at work and in their personal lives. • Learn how to stay positive, despite the setbacks and challenges of life and work. • Mentor others. | } = Human dimension |
| <ul style="list-style-type: none"> • Be able to apply and use what they learn in real-life situations. • Find ways to make the world better, be able to make a difference. • Be creative problem solvers. • Develop key skills in life, such as communication skills. • Become critical thinkers. | } = Application |
| <ul style="list-style-type: none"> • Think holistically rather than in compartments. See the big picture. | } = Foundational knowledge |
| <ul style="list-style-type: none"> • See the need for change in the world and be a change agent. (Application/thinking and human dimension/self) • Dissect problems, reconstruct them into new solutions, and connect the solutions to personal life and lives of other people. (Application/thinking and human dimension/self and others). | } = A Combination |

How Do We Achieve Significant Learning?

If one accepts the value of the learning-centered paradigm, the next question is likely to be: How do we achieve more significant kinds of learning for our students? Simply defining one's teaching goals in terms of the taxonomy of significant learning does not, by itself, improve the quality of student learning. To do that, we must find ways of designing and creating a special kind of learning experience for our courses. Only then is there any likelihood that these more exciting kinds of learning will be realized.

And that is the purpose of the next three chapters in this book. Chapters Three and Four introduce the model of integrated course design as a way of creating more powerful learning experiences for students. Chapter Five provides specific ideas on how to change the way we teach so that significant learning happens more frequently for more students.