

Global Change: Why C.T. is Essential to the Community College Mission

And Why It Will Be Difficult to Achieve

Linda Elder, July 2000

Since the inception of the two-year college almost a hundred years ago, it has served a unique role in the fabric of American society. The community college has sometimes been hailed as the last best chance for many older "returning" students who, for whatever reason, never pursued college upon graduation from high school, and who need to find an employment niche with little time to spare. It has also been regarded as a "secure" starting point for fresh high school grads who want to "get their feet wet" before going on to four-year colleges or universities.

These are undoubtedly only two among a variety of reasons why each fall approximately 5.6 million students now choose the two-year college in this country. But perhaps the greatest contribution of the community college has been its emphasis on teaching students what they will need to become competent employees upon graduation. To a large extent, students enroll in two-year college programs to gain skills and abilities necessary for employment; and many, if not most, community college faculty have maintained classrooms which emphasize learning the technical skills that enable students to do just that.

Until recently, classroom structures which involve "hands on learning" with primary focus on teaching technical skills have, in general, provided specialized abilities students have needed to find gainful employment. However, as the economic structure of the world becomes more complex, as technology continues to transform itself, as the rate of change accelerates, and as we become increasingly more interdependent both at home and abroad, "training" students for job performance in narrowly defined skill areas no longer serves students well.

The Emergent Requirements of Work

The emergent job market holds a number of challenges, for which the average worker simply is not prepared, given current educational practices:

1. the definition and status of virtually every job is in a state of increasing flux
2. entire fields of work now disappear with greater and greater frequency (and unpredictability)
3. more and more jobs involve increasing complexity

4. it is increasingly common for employees to have to understand and work with abstract systems (which are themselves in a continual state of flux)
5. employees are increasingly expected not only to use established procedures but to suggest new ones and be open to change and self-assessment
6. there is increasing emphasis on the ability to clearly communicate with others about mutual problems and the interfacing of multiple systems.

Keenly aware of this reality, Robert Reich, the former United States Secretary of Labor, has pointed out that competent employees in the coming years must be able to think in ways not only not yet emphasized in most present instruction, but in ways that are unpredictable except in broad terms. In *The Work of Nations* (1992), Reich puts it this way

“...in the new economy--replete with unidentified problems, unknown solutions, and untried means of putting them together--mastery of old domains of knowledge isn't nearly enough to guarantee a good income. Nor, importantly, is it even necessary...Facts, codes, formulae, and rules are easily accessible. What is much more valuable is the capacity to effectively and creatively use the knowledge (p. 182).”

Indeed, successful workers of the future must possess intellectual tools which will render them mentally flexible and intellectually disciplined, and thus able to bring higher level thinking to bear on higher level problems. They must, in essence, be able to think critically, to do things with their minds that enable them to effectively handle complex intellectual tasks -- many of which they were not trained for.

According to Reich, instruction which adequately prepares students to function well as high level thinkers,

"instead of emphasizing the transmission of information, the focus is on judgment and interpretation. The student is taught to get behind the data - to ask why certain facts have been selected, why they are assumed to be important, how they were deduced, and how they might be contradicted. The student learns to examine reality from many angles, in different lights, and thus to visualize new possibilities and choices (p. 230)."

Through such emphasis in the classroom, the mind, he says "is trained to be skeptical, curious, and creative (p. 230)."

The higher order thinking that will be required in successful workers of the future is best understood as disciplined reasoning that directs and redirects thinking along a problem-solving path, clarifying and checking itself as it goes. To get a glimpse of such disciplined reasoning consider this hypothetical rendering of the inner voice of the critical thinker--reasoning through an issue:

Let's see...what exactly is the problem? Is there another way to view it? Is this a question that requires judgment, or is there an established procedure for solving it? What information do I need to gather to address the problem? Have I gathered a

sufficient amount of information? Is there another way to interpret this information? Do I need to consider some other points of view? What am I taking for granted? Am I making some assumptions I need to question? Have I considered all the possibilities? What are the implications if I make this decision? And if I make that?...

Sooner or later, employees of the future will be able to make intellectual moves such as these. After all, large amounts of money are made or lost:

- in virtue of attention to, or inattention to, accuracy and precision of information
- in virtue of recognizing, or failing to recognize, important implications
- in virtue of grasping, or failing to grasp, important assumptions
- of interpreting, or failing to interpret, information in alternative ways
- of seeing, or failing to see, a situation from alternative points of view
- of structuring thinking so that is clear and relevant, precise and logical, or failing to so structure thinking, resulting in thinking that it is sloppy, confused, irrelevant, imprecise or illogical

What Does This Mean for Our Conception of Instruction?

Given this reality, it is clear that we are faced with a serious problem. The swiftly changing economic world requires of our graduates' intellectual capabilities which traditional instruction simply is not fostering. To effectively teach, we cannot merely make minor changes in classroom practices. The old model of education no longer serves us well. We need a radically new way of thinking about instruction that replaces instructional beliefs and practices out of alignment with economic reality and transforms our view of education itself.

In what follows I provide a foundation for beginning to understand the conceptual and theoretical changes that must take place in the mind of community college instructors if such a transformation is to be achieved. It should be noted, however, that I will not be dealing, except in passing, with the kinds of teaching strategies that these conceptual changes require. In this article I will simply draw some important contrasts between the thinking behind the present model and that required by the emergent future.

The Struggle of the Old and the New

Before we begin our brief journey, let's get an overview of the path we shall follow. There are three dimensions I will delineate, though the reader should remember that the dimensions are non-linear in nature and hence do not describe a sequence in either teaching or learning. The sequence I present is one of convenience only.

In the first dimension, I sketch a new understanding of "content" and how it is to be "covered." Here we move from thinking about "covering" content through traditional lectures to thinking about how to challenge students to think through the content in a deeply engaged way. We no longer think of content as a collection of data, concepts, and procedures, but as a dynamic mode of thinking, which is truly comprehended only by an actively engaged thinker. "I don't give you data to memorize about management, I expect you to think like a manager." In this model, history is taught as historical thinking, accounting as the art of thinking like an accountant, etc.

In the second dimension, the nature of thinking itself is re-thought. It is no longer enough to simply process the steps of an established procedure; one must learn how to use thinking to examine critically the procedures in use. In this dimension we are forced to another facet of the new model: a new and explicit understanding of the elemental components of reasoning--structures which students must learn to use explicitly. In the new model, we teach students how to manipulate these "structures" explicitly to improve their reasoning. Through this new mode of self-command students learn how to learn, how to internalize new systems and procedures. For example, in the new model students learn the discipline of distinguishing three kinds of questions: "one-system" questions, "no-system" questions, and "multi-system" questions. Understanding this distinction enables students to move from a primary focus on questions of simple fact to more challenging questions which require advanced reasoned judgment.

In the third dimension, there is a shift at the level of standards. We move from an emphasis on narrow or domain-specific technical criteria to an emphasis on teaching universal intellectual standards. In the new model, we teach students how to use universal standards that enable them to monitor their thinking, to adequately assess and improve it.

In general, you should note that all of the changes the new model of instruction requires are ones that reflect a fundamental re-orientation--from training a mind that simply follows established directions and procedures to educating a person who analyzes, evaluates, and produces new directions and new procedures. We move to an emphasis on effectively confronting the complexities inherent in a rapidly changing world.

Dimension One: Content as Thinking

In the old approach to instruction, content has been understood as information students assemble from textbooks and lectures, or as procedures detailed in a manual. The content is "given" to students. The students then "give it back" to the instructor in the same form they received it. Rote memorization is the dominant mode of learning. Regurgitation. Commit it to memory. Spit it back. When exam times come, students cram, cram, cram.

In the new model, content is thought through by the students in challenging activities. Content is treated as inseparable from thinking. In fact, content is understood precisely

as a mode of thinking. Geography is understood as geographical thinking; Anatomy as anatomical thinking; Chemistry as chemical thinking; etc.

For example, an instructor might begin a basic algebra class with the announcement that the course will focus on algebraic thinking. The students would then be coached in algebraic thinking in collaborative groups. The students would be expected to explain how they were using algebraic principles in their thinking. Seminal insights into basic principles of algebra would replace memorization of algorithms and fixed algebraic procedures. Instructors would ensure that genuine understanding was achieved before students would move to new concepts.

In a new model history class, for example, we would want students to reason historically in a multitude of ways, including being able to ask important questions that historians ask. But even more important we want students to be able to deal with the historical questions in their own lives and to develop question-analyzing skills that they can use in every subject they study. We want them, routinely, to be able to relate the questions they study in one class to questions in other classes, and to important questions in their lives. We want them thinking so that they are continually making connections and weaving important ideas together.

To sum up the first dimension, the new model our teaching is based on the assumption that to effectively learn content students must critically think it through. Thus, as instructors, we aim at the dual purpose of helping students develop their reasoning abilities (in general) while they are “thinking through” our content (in particular). In participating in a new model class, students are simultaneously learning highly transferable intellectual skills as they are approaching domain-specific problems. The domain-specific problems are approached with a view to how we can approach any problem in any context. Thus, we use our content, not as an end in itself, but as a powerful academic means to the broader goal of teaching students how to clearly articulate problems, how to gather information to address those problems, and how to come up with feasible solutions--irrespective of the domain of the problems.

Dimension Two: Rethinking Thinking and Its Parts

In the second dimension, the very nature of thinking itself is re-thought. No longer is it enough to blindly follow the steps of a procedure, the student must now learn how to actively reason between and among conflicting procedures, to make decisions involving conflicting systems, to exercise conscious reasoned judgment.

In the old model, reasoning was understood as a narrow set of skills students needed to learn to perform certain specific tasks on the job. "Follow this step by step procedure to solve these problems." "When this happens take this step."

"When that happens take this other step." Thinking is proceduralized. Reasoned judgment, involving the comparing of conflicting procedures, was minimized. The new model focuses on developing in the minds of students' awareness of the

possibility of their making a whole family of powerful intellectual moves, intellectual patterns which aid them in reasoning well with respect to any issue or problem they might face. In the new model, students to learn to go beyond strict procedures.

They learn to assess and improve procedures. To do this they need to know how to "orchestrate" intellectual acts in their minds while they are reasoning. They must learn a systematic way to take their thinking apart--irrespective of what they are thinking about. Such skills require an insight into how the intellect functions when it is reasoning well. Let's look at those key functions briefly.

According to one of the best-known authorities on critical thinking, Richard Paul (1995), whenever we reason, however well or poorly, we use eight structures. The structures include question, purpose, information, interpretation, assumptions, concepts, point of view, and implications. These "elements" are always embedded in our thinking, for:

- whenever we reason, we do so for a purpose
- our purpose requires us to settle or answer at least one question
- to answer our question, we need some information
- to use that information, we must interpret it
- to interpret it, we must use some concepts
- to use some concepts, we must make some assumptions
- to make some assumptions, we must think within a point of view
- however, we think our thinking has implications

Being able to take charge of our thinking in a broad and disciplined manner requires that we learn how to routinely take charge of these kinds of structures. How well we do so ultimately determines the quality of our reasoning in any given situation. For example, take the category of "question" as a case in point.

In the old model, problem-centered instruction primarily focused on questions of fact (one-system questions), questions for which there is only one right answer (because we have a system in place for answering them). And when facing a complicated question with better and worse answers, students often reasoned poorly. These "solutions" they came up with were often poorly supported because the students lacked perspective in reasoning whenever they did not have a fixed procedure to follow.

In contrast, the new model focuses, not on questions of fact (though of course students must master questions of fact), but primarily on questions that require students to make reasoned judgments (multi-system questions). Why? Because complex problems, the

type they will face when they enter the workplace, inherently call for high quality judgments between conflicting systems or approaches.

In the new model, then, students learn to explicitly identify the kind of problem or question they are dealing with (Richard Paul, 1995). Is it a one-system question (with one correct answer)? Is it a no-system question (with every answer a matter of pure subjective preference)? Or is it a multi-system question (with better and worse answers)? Let us now look more closely at these three kinds of questions.

The first type of question involves one established system or procedure for obtaining the answer. The objective when dealing with questions in this category is to determine what that established method is, and then to follow the identified method to the answer.

These are questions of fact, or knowledge. Examples are: What is the boiling point of lead? What is the differential of this equation? What is the chemical composition of air? How does the motherboard on this type of computer work?"

The old mode of instruction focuses predominantly on these one-system questions and treats them as ends themselves. In the new model questions of fact are mastered in relation to questions that call for reasoned judgment. Thus, students learn the value of being able to find information; they learn various ways to locate facts; but they learn to do so primarily as part of the reasoning process when dealing with complex questions.

The second type of question, questions involving preference, are questions for which there are as many right answers as there are individual responses. Examples of this sort of question include "What is your favorite color of cabinet? What type of food do you like best? Would you rather wear blue jeans or sweat pants? What kind of job do you enjoy best? Answers to this second type of question cannot be critiqued since they involve pure subjective taste. Thus, in the new mode of instruction students learn that answers to such questions cannot be assessed. Any answer is as good as any other answer. As a result, we avoid focusing attention on these dead-end questions. We set the purely subjective aside to deal with those matters where judgment and quality of reasoning are essential.

The third type of question is, as we have seen, that which is dominant in the new economic realities. These are questions to which there is no one right or wrong answer, though evidence and reasoning are essential to the plausible answering of them. There is no one established way of thinking about them, though how we think about them has important implications in our economic lives. These are questions which frequently call for crucial answers.

Our economic success often depends upon them. They are questions that require our best thinking--because they require thinking within multiple points of view and marshaling information in the best way we can. Questions in this category include: "What are the best methods for reducing crime in America? What is our best strategy for meeting the new product line introduced by our competitor? How can we best invest this capital? What is the best strategy for increasing our productivity level while also

improving the quality of our products? How can we improve morale at the same time that we downsize?"

Being able to routinely distinguish one-system, non-system, and multi-system questions illustrates one important way in which students must learn to take command of the various component structures in their thought. If they don't achieve intellectual control over the problem they are trying to solve, they will not be able to solve it. We cannot solve problems we don't understand.

In the new model, then, we explicitly teach students to take their thinking apart, to take charge of the structures in which they are reasoning, and we do this in conjunction with students learning a set of universal standards for assessing thinking. Let us now turn to the question of standards.

Dimension Three: Teaching Students Universal Intellectual Standards

In the third dimension, we recognize the need for universal standards for thought. The old model of instruction emphasized domain-specific technical criteria. "Perform this procedure in this way." "Answer 90% of the test questions correctly." "Follow these directions." "Demonstrate that you can apply these mathematical formulas."

The new approach, concerned with holding students responsible for their thinking in a generalizable way emphasizes broad-based, not domain-specific intellectual standards. Thus, students come to understand what it means to think and to act as persons who are intellectually responsible for their performance--in general, not just in standardized technical problems they can predict. For example, the new model emphasizes the following:

1. to think well, one must think clearly
2. to think well, one must think accurately
3. to think well, one must think precisely
4. to think well, one must think relevantly
5. to think well one must think deeply
6. to think well, one must think broad-mindedly
7. to think well, one must think logically.

In the old model students often learned how to function competently only in a narrow job and with standard problems, while their thinking in general remained largely undisciplined. Outside a narrow sphere of performance, they often thought unclearly,

inaccurately, imprecisely, irrelevantly, superficially, and illogically. Needless to say, this did not auger well for their performance outside their special competence.

As long as much of student thinking remains subconscious--as it does for most students (since they lack the skills to bring it to their conscious minds for scrutiny) --it tends to operate with "standards" that cannot consciously be justified. In fact, if we pay special attention to how students decide to accept or reject ideas, we will find that most students use standards that are actually anti-intellectual in nature. They use standards that emerge from primitive human drives, standards that subconsciously control their thinking and leave their thinking deeply flawed.

Here are the most common standards that students use (unfortunately, they are precisely the ones most undisciplined thinkers use). They are:

1. believe an idea if it agrees with what you already believe (an egocentric standard)
2. believe an idea if it agrees with what your friends or associates believe (a sociocentric standard)
3. believe an idea if you want to believe it (an exercise in willful self-deception).

Think of the way the brass of Detroit auto reasoned during the 15 years that they were losing market share to the Japanese: "These Japanese cars are nothing but a fad. Americans don't want small economic cars. They want style and size and comfort. We just need to outlast the fad, not change our basic manufacturing strategies." It wasn't until Detroit went virtually bankrupt that they considered an alternative line of thought. Their agreement with each other, their tendency to believe what they wanted to believe, were the ruling standards for their thinking. They invested billions in lousy thinking. And the US economy suffered a severe blow because of it.

Obviously, these are not standards for thinking that we want to foster in our students. Yet the old model fails to teach students how to recognize when these standards are at work in their thinking.

In the new model, however, students are taught to guard against natural human tendencies to believe what agrees with them or what they want to believe. Instead they learn to how to maximize objectivity in assessment, however painful the "truth" might be. Without this discipline, students will be frustrated in complicated or messy problems and will retreat to comfortable beliefs. Accordingly, instead of exercising self-determination in their thinking, students become victims of their thinking. In the old model, students don't control their thinking; their thinking controls them.

Conclusion

It is now undebatable that workers of tomorrow must have basic critical thinking abilities if they are to function well in the complex world of accelerating change that now faces them. They must have the intellectual skills to competently address new questions and problems inherent in the new emerging world of work. This involves the ability to take thinking apart and analyze it, as well as to consistently apply intellectual standards to it. They must be able to accurately and consistently assess their thinking, to determine, their own strengths and weaknesses and project strategies for continual improvement.

Since two-year colleges have historically led the higher education community in preparing students for the world of work, they are in a unique position to take the lead once again. But this involves commitment and leadership on the part of the faculty and the administration.

The shift from the old to the new model is not a casual or easy shift. It will be years before it occurs at most four-year colleges and universities--where teaching effectiveness is a secondary factor. It will not occur easily at any level of education.

It will certainly not occur at the community college level simply because community college faculty read a general argument for the new model such as this article constitutes. One might begin with such an article. But one does not end with it. Faculty need quality Inservice in the design of instruction based on new model criteria. They need paradigms. They need examples. They need practice. And they need to be encouraged and rewarded for designing new model classes.

If we are to make the changes necessary for our students to compete in a highly complex global market, the band-aid, quick fix approach to transforming our educational systems must be abandoned. With leadership and determination, the new community college of the future can and will emerge. But that leadership and determination will not be successfully generated unless we are willing to do the intellectual work necessary to transform our own thinking. We need to think our own way into new conceptions about what teaching and learning are all about. We need bona fide critical thinking. As Richard Paul has said:

“What we can be sure of is that the persuasiveness of the argument for critical thinking will only grow year by year, day by day -- for the logic of the argument is simply the only prudent response to the accelerating change, to the increasing complexity of our world. No gimmick, no crafty substitute, can be found for the cultivation of quality thinking. The quality of our lives can only become more and more obviously the product of the quality of the thinking we use to create them (p. 16) ...Our students deserve at least a fighting chance to compete, to rise to the challenge of the day (p.5).”

All quotes by Richard Paul in this article are taken from the book by Paul, R. (1995). *Critical Thinking: How to Prepare Students for a Rapidly Changing World*. Dillon Beach: Foundation for Critical Thinking