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Introduction

The goal of this book is to persuade the reader on two points. The first is that in a world of accelerating change and complexity, a new form of thinking and learning is required, a form of thinking and learning that involves much more intellectual discipline and skills of self-evaluation than we have yet learned to accept. The second is that the economic progress of the future will be increasingly tied to social, educational, and even "moral" progress. In the future, it will become harder and harder for societies to achieve economic success while they exploit, and maintain in a subservient role, the large mass of people. The economic well-being of the future will require the intellectual empowerment and freedom of ordinary, not just extraordinary people.

The Logic of Adapting to Accelerating Change and Complexity

Critical thinking is the essential foundation for adaptation to the everyday personal, social, and professional demands of the 21st Century and thereafter. The most inescapable imperative of the future is continuous change, change that involves complex adjustments to the increasingly complex systems that dominate our lives. Therefore, the distinguishing characteristics of those who will not only survive but flourish in the future, will be traits and abilities, both intellectual and emotional, that entail excellence in evaluating and responding to complex changing conditions.

Yet the mind is not by nature adaptable to changes of the breadth and depth that we are facing. Rather the mind is instinctively designed for habit, associating "peace of mind" with routine. The mind's natural inclination is to reduce the new to the old, the complex to the simple, and everything as much as possible, to familiar, well-grooved patterns and habits. It is not natural for the human mind to continuously re-think its systems, its routines, its habits — in fact, it is downright threatening.

If we juxtapose the nature of the future with the nature of the human mind, confusion is the inevitable result. We cannot arrest the accelerating changes of our future, nor can we simplify the challenges to come. Therefore, we must adapt our minds. We must ready them for complexity and change. What will the particulars of this adaptation be?

We need to construct, through socialization, education, and new social practices, a new "second nature" for the mind. We must work within the human propensity toward habit by learning how to shape our minds to a qualitatively different kind of habit: the habit of not only continually changing but of continually expecting to change. We must cultivate the habit of continually raising our systems of routine to a conscious level with the express purpose of reshaping them in an unending series of acts

of intellectual self-improvement. No domains of our lives — as teachers, parents, citizens, workers — will be spared if legitimate "peace of mind" is to be restored.

It will never again do to think exclusively within one fixed belief system. The cruel illusion of security in permanence will continue to tantalize us, but we must prepare ourselves to live within flux rather than constancy, to be comfortable with the unexpected and problematic, to expect the unexpected, even, in fact, to create the unexpected and problematic as a "natural" part of day-to-day living and thinking. Ceaseless, incessant, perpetual adjustments to novel, unfamiliar intricacy now becomes the only permanent rule. Skill in turning systems inside out, frequently restructuring and recasting them, will be the basis for high-paid labor and the challenge of sound leadership.

For our adaptations to succeed, we must enhance our abilities to evaluate ideas, changing conditions, and events. We will prevail to the extent that we cultivate minds that habitually probe the logic of the systems of the status quo as well as the logic of the possible variations and alternative systems, approaching each with questions that enable us to assess both strengths and weaknesses.

EDUCATION IN A NEW KEY: THINKING, KNOWING, & LEARNING

Our political, social, educational, and economic institutions, unfortunately, are totally unprepared for this kind of revolutionary change. Let's look into one institutional domain as a point of reference. When one lays 21st Century global imperatives against the routines of modern education, for example, the misfit is obvious. Not only are school administrators and teachers insulated from these imperatives, but even if they recognized them, they are not by preparation, practice, or inclination ready to respond. If for no other reason, their own education was severely lacking in stress on intellectual abilities, intellectual traits, and intellectual standards. They have not learned the art of disciplined reasoning. They are often poor problem solvers; they tend to approach all problems from the point of view of expediency and the protection of their images. In any case, they show no sign of recognizing the profound difference between students memorizing the conclusions of others and students reasoning to those conclusions on the basis of their own disciplined thought. They are locked in the past. They do not know that they are. They are not striving to free themselves.

What is at the root of this distorted vision, this rigidity? What new understandings and insights do we need? First and foremost, we need to understand the kind of labor or work a mind needs to do to deeply transform itself. We need to deeply understand the relationship between thinking, knowing, and learning. For we don't simply need to learn *faster*. We need to learn *better*. High quality thinking and learning is essential to our future. But why can't we understand this and what it entails?

Chapter 1

Accelerating Change, the Complexity of Problems, and the Quality of Our Thinking

with Jane Willsen

Abstract

The goal of this chapter is to trace the general implications of what are identified as the two central characteristics of the future: accelerating change and intensifying complexity. If change continues to move faster and faster, and if the changes that do occur become more and more complex, how are we to deal with the world? More specifically, how are we to understand how this change and complexity will play itself out? How are we to prepare for it? Paul and Willsen focus on the economic and educational dimensions of these questions. They lead us into and through the vision of four of our most penetrating thinkers: Robert Reich, Lester Thurow, W. Edward Deming, and Robert Heilbroner. The general thesis is that the visions of these thinkers are complementary and that collectively they provide us with a rich and pointed picture of what we must do, not because they are "visionaries," but because they have done the profound analytic work which enables them to shed a clear light on very general patterns, all of which add up to accelerating change, intensifying complexity, and critical thinking. The chapter ends with an analysis of the implications for parenting, work, and education of the foundational fact that "the work of the future is the work of the mind, intellectual work, work that involves reasoning and intellectual self-discipline."

✦✦ *The Nature of the Post-Industrial World Order*

The world is swiftly changing and with each day the pace quickens. The pressure to respond intensifies. New global realities are rapidly working their way into the deepest structures of our lives: economic, social, environmental realities — realities with profound implications for teaching and learning, for business and politics, for human rights and human conflicts. These realities are becoming increasingly complex; and they all turn on the powerful dynamic of accelerating change. This chapter explores the general character of these changes and the quality of thinking necessary for effectively adapting to them.

Chapter 9

Critical Thinking:
Fundamental to Education for a Free Society

Abstract

In this paper, written for Educational Leadership *(1984), Paul argues that educational reform will not produce meaningful change unless educators explicitly grasp five inter-related truths: that students, as all people, tend to reason egocentrically; that multi-dimensional problems, traditionally ignored, ought to be central in schooling; that indoctrination into prevailing views has inappropriately been the major academic response to real world problems; that children from the earliest years need to be encouraged to think for themselves through dialogue, discussion, and constructive debate; and, finally, that "teaching strategies need to be revamped across the board" to stress the development of dialogical and dialectical thought. Paul summarizes his thesis at the close: "An open society requires open minds. Collectively reinforced egocentric and sociocentric thought, conjoined with massive technical knowledge and power, are not the foundations for a genuine democracy."*

✦ *The Emerging Critical Thinking Movement*

The "critical thinking movement" is now, after a long and halting start, building up a head of steam. Predictably, numerous quick-fix, miracle cures have sprung up, and turning to them is tempting, especially given the increasing variety of imperatives and mandates under which schools operate. I argue in this paper for a different understanding of how to proceed. I advocate both a short-term and a long-term strategy, based on an analysis of where we now stand and what we should strive for ultimately.

I argue that our strategy should reflect a realistic appraisal of the following factors: *1)* the basic cognitive and affective tendencies of the human mind in its normal, uncritical state, *2)* the categorically different problem types and the reasoning appropriate to them, *3)* the social and personal conditions under which cognitive and affective processes develop, *4)* the present critical thinking skills of teachers and students, and *5)* the fundamental intellectual, affective, and social obstacles to the further development of such skills.