ISBN 978-0-9796659-6-7

Inspiring Exemplary Teaching and Learning

National Collegiate Honors Council

NCHC
Monograph Series

Inspiring Exemplary Teaching and Learning: Perspectives on Teaching Academically Talented College Students

Larry Clark and John Zubizarreta, Editors

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INSPIRING EXEMPLARY TEACHING AND LEARNING: PERSPECTIVES ON TEACHING ACADEMICALLY TALENTED COLLEGE STUDENTS

Larry Clark and John Zubizarreta, Editors

A Companion Piece to

Teaching and Learning in Honors

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Published in 2008 by
National Collegiate Honors Council
1100 Neihardt Residence Center
University of Nebraska-Lincoln
540 N. 16th Street
Lincoln, NE 68588-0627
(402) 472-9150
FAX: (402) 472-9152
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http://www.NCHChonors.org

International Standard Book Number 978-0-9796659-6-7

Managing Editor: Mitch Pruitt
Production Editor: Cliff Jefferson
Wake Up Graphics, Birmingham, AL

Printed by Commercial Printing Company, Birmingham, AL

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INTRODUCTION

Shakespeare got it wrong! Love's labor is not lost. Our volume is testimony. It is a labor of love born of an unquenched passion for the art and craft of teaching and its powerful, transformative influence on learning. All of the authors in this second in a series of monographs on teaching and learning commissioned by the National Collegiate Honors Council are dedicated to exploring the sometimes magical, sometimes ordinary, sometimes rewarding, sometimes challenging connections between good teaching and deep, lasting learning. We know today, under the influence of questionable pressures of accountability and outcomes assessment on the profession, that teaching and learning are not necessarily linked by causality. We teach, but do our students really learn? How do we know? Our students learn, but have we caused the learning, or have they learned despite us? What courses, what pedagogical strategies, what assignments, what out-of-class activities result in rich, authentic learning, the kind of learning characteristically claimed by honors or other superior academic programs? What distinguishes advanced learning, exemplary teachers, high-achieving and academically talented students? How do we nurture such teachers and students in stepped-up programs designed for enhanced educational opportunities and outcomes? Such questions and others underlie the issues, approaches, and shared resources of this volume.

Traversing the landscape of higher education today, we notice several themes immediately. One is the groundswell of interest in reflective practice and all of its implications: critical thinking, problem solving, and ethical and moral reasoning. A second is the emphasis on faculty development and pedagogical innovation and creativity: the knowledge, tools, and dispositions needed by faculty to motivate students and teach them well. Curricular, program, and institutional reform is a third: how do we change what we have always done to achieve better faculty performance and more engaged student learning? The compelling power of integrative learning is another: collaborative learning, cooperative learning, team-based approaches, interdisciplinarity, and synthesis of knowledge bases mirror an ever-increasing call for crossing boundaries in educational practice. Diversity stands out as a chief issue in the academy: accessibility, fairness, support, equality, and other concerns permeate conversations in higher education. Technology and assessment are two more.

Of course, one might add to the list, but we believe that while the various contributors to our volume may not address each of the issues

above as a central focus of their pieces, they certainly, in one way or another, directly or indirectly tackle the concerns within the context of honors-level teaching and learning in higher education. Much more work obviously needs to be done. Our hope is that the volume will answer some questions, share some new ideas, reaffirm successful practice, showcase a few admirable approaches to skilled instruction and robust learning, and challenge comfortable and predictable approaches to teaching and learning. More importantly, we wish to raise new issues for us to ponder as we reflect on our calling and seek to improve our impact on student learning.

We expect that faculty, students, and administrators from all segments of higher education will find the volume interesting and instructive. We mention "honors" frequently, but the contents of our book have much wider relevance. Teaching and learning in honors, gifted, accelerated, or differentiated classrooms offer models of what teachers should be doing in all classes, all programs, all institutions. In fact, many of the teaching strategies and theories about learning that form undercurrents in the larger conversations of best practice in higher education have been firmly rooted in honors and comparable academic programs for some time already. Such programs have always highlighted and encouraged, as fundamental to their missions, innovative, creative approaches to teaching and learning, often employing cutting-edge methodologies growing out of student-centered educational philosophies and constructivist principles before such terms were mainstream. Such programs, too, have advocated steadily and passionately for the power and inherent worth of liberal learning; intellectual rigor; restless inquiry; and civic responsibility, service, and leadership as opposed to the reductive pressures of disciplinary silos, professional tunnel vision, and lucrative careerism. Educators and students working at all levels in colleges and universities and dedicated to liberal education and exciting ideas for improving teaching and learning will find this book useful.

We want our text to stand as a compilation of best practices in teaching and learning, a resource for nudging all faculty, students, administrators, policy makers, and other constituents inside and outside the academy toward a model of outstanding teaching and learning. We see such a model commonly in honors-level programs, but the model should also be the standard that enhances all of higher education. Our work together should be a labor of love for inspiring exemplary teaching and significant learning.

Part One:

Crossing Boundaries, Integration, and Dialogic Learning

Numerous metaphors for learning are based on the idea of exploring new areas. Phrases such as "breaking new ground," "sailing uncharted waters," and "scaling new heights" carry with them the idea of learning, sometimes learning things that are exotic in relationship to what we knew previously.

Even when venturing into areas uninhabited by humans, we have discovered fascinating worlds different from the one we inhabit. Our belief that all life on Earth ultimately derives from the sun was disproved by the discovery of previously unimagined life forms living around thermal vents at the bottom of the ocean. Astronauts who had the opportunity to view the lush Earth from the barren plains of our moon returned home changed people. New places can teach us about variations in domains such as geology, climatology, and ecology.

When we mix in the effects of different peoples in different lands, the number of possible variations multiplies. Peoples can vary by language, by social structure, by faith, by race, by economy, and by art and music. Crossing geological, cultural, and ideological boundaries can generate some of our richest learning experiences.

The National Collegiate Honors Council has shown its belief in the idea of learning by crossing boundaries through its support of such programs as the Honors Semesters and City as Text™. The authors in this section provide a variety of perspectives on how crossing boundaries contributes to the goal of effectively teaching high-ability students.

From a developmental perspective, the transition from high school to college is a particularly significant one. Important changes occur not only in the educational context, but also in significant relationships and in one's concept of self. **Anne Rinn** describes some of the issues that affect talented students as they cross the matriculation boundary.

Judith Ramaley notes that the traditional structure of most institutions of higher learning perpetuates epistemological isolationism. She challenges faculty and administrators to explore new ways to assimilate teaching across disciplinary boundaries, to link classroom teaching with real-world experience, and to reward faculty who find creative ways to integrate their efforts in the areas of teaching, scholarly activity, and service.

Organizations as well as individuals can benefit by crossing boundaries. In recent years the National Collegiate Honors Council has increased its efforts to form linkages with other organizations that share its educational goals. **Bernice Braid** reports on a panel presentation made by several members of the NCHC at the national meeting of the Association of American Colleges and Universities. She enumerates many similarities in the goals of the two organizations to promote development of effective liberal education.

We live in contentious times. Loyalties to political parties, ideologies, religious groups, even sports teams and entertainers, supported by increasingly fractionated information sources, have made bridging individual worldviews increasingly difficult. **Jim Knauer** discusses how dialogic pedagogy can help students develop skills to make them aware of and open to world views that differ from their own.

CHAPTER ONE: PRE-COLLEGE EXPERIENCES AND CHARACTERISTICS OF GIFTED STUDENTS

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In fields such as psychology and education, among others, we often look to the past to understand the present and pose questions: "How do past experiences shape current experiences?" "How do early educational programs affect performance later in life?" The study of honors college students is no different: "When one considers the effects of the college experience on individuals, it is helpful to know what kinds of prior experience they bring with them. . . . Thus looking at some of the literature on talented teenagers might help identify some of the precursors of life as talented college students" (Clark, 2000, pp. 8–9). Understanding the pre-college experiences and characteristics of gifted students will thus help in the recruiting, supporting, and developing of honors students. The purpose of this chapter is to provide a brief overview of these experiences and characteristics, so that honors faculty and administrators will be more familiar with the backgrounds of honors students.

Pre-College Programs for the Gifted

Students identified as gifted at the elementary and secondary education levels are as varied as honors students. A single definition of a gifted child does not exist, but many formal definitions are similar. The most current federal definition of gifted individuals comes from the 1994 reauthorization of the Jacob K. Javits Gifted and Talented Students Act of 1988, which states that gifted students are those "who give evidence of high performance capability in areas such as intellectual, creative, artistic, or leadership capacity, or in specific academic fields, and who require services or activities not ordinarily provided by the school in order to fully develop such capabilities" (P. L. 103–382, Title XIV, p. 388). A similar definition used in most state legislation today was developed in 1972 by the United States Commissioner of Education, Sidney Marland, in a report on the status of the education of gifted and talented children. It mandates that gifted children

"demonstrate achievement and/or potential ability in any of the following areas: 1) general intellectual aptitude, 2) specific academic aptitude, 3) creative or productive thinking, 4) leadership ability, 5) visual and performing arts" (p. 2). Still others rely solely on an intelligence test score (IQ) in the upper 2% of the population (Clark, 2002).

Identification for gifted programs is thus dependent on one's definition of giftedness. The misidentification and underidentification of gifted students are currently a problem but beyond the scope of this chapter. Once students are identified as gifted, though, special programs exist for them. Most educators and researchers believe that special programs are necessary for the gifted because of their unique learning needs (Olszewski-Kubilius, 2003). Gifted programs usually offer a challenging and fast-paced curriculum, which is quite different from what gifted students typically experience in the regular classroom. The following briefly outlines a few types of programs at the elementary, middle, and high school levels, as well as programs outside of school.

Elementary School

- Early admission to kindergarten or first grade
- Accelerated promotion (i.e., grade-skipping or subject-skipping)
- Pull-out or resource rooms, such that gifted students spend most of their time in a regular classroom and spend several hours a week in a gifted classroom

Middle School and High School

- Honors and/or Advanced Placement classes
- Early entrance to college
- Independent study, internships, mentorships
- Residential high schools
- Distance-learning courses

Programs Outside of School

- Residential summer camps based at a university
- Super Saturday programs (i.e., classes on Saturdays)
- Study abroad
- Academic competition teams

Characteristics of Pre-College Gifted Students

The research literature regarding gifted students at the elementary and secondary levels is vast, offering extensive coverage of the characteristics of pre-college gifted students (see Clark, 2002; Colangelo & Davis, 2003; Davis & Rimm, 2004). The following is a brief overview of some major themes regarding the characteristics and experiences of pre-college gifted students.

Boredom in School

Many researchers suggest that gifted students are bored with their academic coursework prior to attending college. For example, Gallagher and Harradine (1997) found more than half of 871 gifted students at the elementary, middle, and secondary levels thought classes in core subjects, such as math or science, were not challenging, and the intellectual stimulation likely continues to decrease as students move from middle school to high school (Plucker & McIntire, 1996). Kanevsky and Keighley (2003) identify five factors that distinguish boring from learning experiences in school: control over one's learning experiences, choice with regard to one's educational environment, a challenging curriculum, complexity in one's learning experiences, and teachers who care about teaching and their students. When all five factors are present, gifted students are likely to engage in learning and produce high quality-work. Boredom in school can lead to underachievement, as "a dull meager curriculum . . . often destroys the gifted student's motivation to achieve in school" (Sisk, 1988, pp. 5–6).

Learning Styles

A student's learning style refers to his or her preference for physical and sociophysical conditions in teaching and learning (Griggs & Dunn, 1984). Gifted students' preferred learning styles may vary somewhat, but several researchers have found common themes. For example, many gifted students at the elementary and secondary levels tend to be independent, self-motivated, persistent, and appreciative of learning tasks that are flexible, unstructured, and open-ended (Griggs & Dunn, 1984). In addition, gifted students prefer instructional strategies that emphasize independence (Stewart, 1981). When taught through their preferred learning styles—which may include the usual catalog of styles such as visual, verbal, auditory, kinesthetic, logical, and others—gifted students may be more likely to achieve at a higher level and exhibit a better attitude toward school (Dunn, 1984).

Motivation

In general, students identified as gifted tend to have higher levels of intrinsic motivation than students who are not identified as gifted (Gottfried & Gottfried, 1996). Students who are intrinsically motivated engage in an activity because they value participation in the activity itself, as compared with those who are extrinsically motivated, for whom engagement and effort are contingent upon some outside reward like grades, money, or prestige.

Students with high academic intrinsic motivation usually persist in the face of adversity and achieve at a higher level, among other behaviors (Gottfried, Gottfried, Cook, & Morris, 2005). While gifted students are often highly motivated in general, they may not always be highly motivated in the classroom, particularly if they perceive the coursework as boring or irrelevant (Clinkenbeard, 1996).[1]

Perfectionism

Most gifted students experience some form of perfectionism (Orange, 1997; Schuler, 2000), as do many college honors students (Parker & Adkins, 1995; Speirs Neumeister, 2004). Researchers note the differences between healthy and neurotic perfectionism. Students with healthy perfectionism appear motivated and seem to enjoy their studies, which usually lead to high achievement. On the other hand, neurotic perfectionists do not appreciate their work or experience pleasure from their efforts because they feel that their accomplishments are never good enough (Hamachek, 1978). Many researchers have linked neurotic perfectionism with various psychological problems, including depression, eating disorders, obsessive compulsive disorder, and panic disorder, among others (Parker & Adkins, 1995).

Self-Concept

Self-concept can be defined as "a person's perceptions of him- or herself . . . formed through experience with and interpretations of one's environment" (Marsh & Shavelson, 1985, p. 107). The self-concept is important because of its relationship to other factors, including academic achievement and aspirations. Students with higher academic self-concepts generally also have higher academic achievement (House, 1997; Marsh & Yeung, 1997) and higher aspirations (Farmer, 1985; Gottfredson, 2002).

Gifted students generally have higher academic self-concepts than average-ability students (Dixon, 1998; Colangelo, Kelly, & Schrepfer, 1987). When they are admitted to a program for the gifted, however, their self-concept may temporarily increase or decrease. Marsh and

Parker's Big-Fish-Little-Pond Effect (BFLPE; 1984) posits that gifted students in low-ability programs will have higher self-concepts than gifted students in high-ability schools, which can be explained by a change in a student's reference group. For example, when gifted students enter a gifted program after having been part of a mixed-ability level program, they are suddenly surrounded by peers of equal ability, a situation that challenges their prior perceived competence level.

On the other hand, gifted students' self-concepts could increase upon admission to gifted programs. This increase may be explained by the reflected-glory effect (Cialdini & Richardson, 1980), whereby gifted students who are enrolled in gifted programs are "basking in the reflected glory of successful others by merely . . . joining highly valued social groups" (Marsh, Kong, & Hau, 2000, p. 338). The students' academic self-concept could be therefore enhanced by virtue of being members of a highly accomplished group.

Factors in College Choice

What a gifted student expects from a college or university is important in influencing his or her decision to choose a particular institution and/or honors program. Although research on expectations and needs of gifted students is sparse, this information may be useful to administrators in attracting talented students to their institution. Douglas and Powers (1985) found that four factors were important in choosing an institution of higher education among high school-aged gifted students: 1) academic quality of the institution; 2) social aspects of the institution; 3) affordability and other financial considerations; and 4) special institutional factors, such as the degree of emphasis on grades and whether or not one's parents or friends attended the institution. Similarly, for a group of gifted students, low tuition, well-credentialed faculty, research orientation, and the institution's fiscal stability or strength appear most important in determining institutional attractiveness (Anderson, 1976). Gifted high school students, as identified by their scores on the ACT, expect career counseling, opportunities for independent study, honors coursework, and financial aid in higher education (Kerr & Colangelo, 1988; Kerr, Colangelo, Maxey, & Christensen, 1992).

Pre-college gifted students also expect to be highly involved in extracurricular activities in college, especially in departmental clubs and special interest groups (German, 1995; Kerr & Colangelo, 1988). A related finding is that some gifted students might choose an institution

of higher education based on whether their friends are applying to that institution, particularly among economically disadvantaged, minority gifted students (Olszewski-Kubilius & Scott, 1992).

Collectively, these studies suggest that both academic and social factors are important aspects of gifted students' expectations of their college experiences. Gifted students' expectations appear similar to lists of conditions that foster student learning among all students (Kuh, 1996). Regardless, research suggests that the academic climate of a college or university is important to the development of gifted students and/or in attracting gifted students, and that opportunities for fostering social skills through academic endeavors are also important.

Bridging the Gap between Gifted and Honors

Although we cannot entirely typify gifted students at any level, we can guess that many incoming honors freshmen had similar experiences prior to attending college. Many gifted students experience boredom in the classroom yet may also be highly motivated, prefer some independence in learning, experience perfectionism, and feel relatively good about their academic abilities. Many gifted students may also have experiences with honors and/or Advanced Placement coursework, special Saturday or summer programs for the gifted, or school-based programs for the gifted, among other experiences, which may affect their experiences at the postsecondary level. Finally, gifted students appear to have high expectations for their college experience. In being aware of the pre-college experiences and characteristics of gifted students, honors faculty and administrators can bridge the gap between gifted programs and honors programs.

Endnote

[1]For more information on motivation, see Clark's chapter on "Motivational Issues in the Education of Academically Talented College Students" in this volume.

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CHAPTER TWO: TOWARD A MODEL OF INTEGRATIVE LEARNING: THE PLACE OF SCIENCE IN AN HONORS CURRICULUM

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Overview

The Greater Expectations Panel assembled by the Association of American Colleges and Universities (AAC&U) spent two years exploring what it means to be well educated. In 2002, the panel issued a report calling for a fresh approach to liberal education that would produce graduates who are prepared for life and work in the 21st century and who are "*intentional* about the process of acquiring learning, *empowered* by the mastery of intellectual and practical skills, *informed* by knowledge from various disciplines and *responsible* for their actions and those of society" (Foreword by Andrea Leskes in Huber and Hutchings, 2004, p. iv). To accomplish the formidable charge, an education must create an environment in which students can bring together their formal studies and their life experiences, explore and understand the worldviews of different fields, learn how to examine a complex issue from multiple perspectives, and bridge the often daunting gaps between theory and practice, contemplation and action.

There are many impediments to achieving this goal of a grand integration and a reweaving of the often fragmented ways in which our colleges and universities choose to organize their scholarly life. The goal is easy to articulate but difficult to realize in practice. According to the joint statement by the AAC&U and the Carnegie Foundation for the Advancement of Teaching on Integrative Learning, "Integrative learning comes in many varieties: connecting skills and knowledge from multiple sources and experiences; applying theory to practice in various settings utilizing diverse and even contradictory points of view; and, understanding issues and positions contextually (Huber and Hutchings, 2004, p. 13). Such learning goes against the grain of our own scholarly lives as well as the structure and organization of our

colleges and universities. We have not recovered from the invention of the Carnegie Unit that broke our curriculum into courses and credits. To this historic pattern we can add the strong influence of the massive national investment in university-based research that reshaped our institutions into vital contributors to the nation-building and economic development goals of the Federal government and reinforced the research university model of organizational structure and purpose. The infusion of such capital left the undergraduate teaching function as a secondary role of our major universities. Compounding this reshaping of the university enterprise in recent years is the growing complexity of enrollments in postsecondary education as students have moved in swirling pathways across the educational landscape, taking courses from many institutions, often enrolling in two or more in any given semester.

Such trends and patterns of societal influence and changing participation have led to a series of gaps between the professions and the liberal arts, general education and the in-depth study of the major, formal study and daily life, academic affairs and student affairs, research and teaching. As Gerald Graff puts it (qtd. in Huber and Hutchings, 2004),

> One of the oddest things about the university is that it calls itself a "community of scholars," yet it organizes itself in a way that conceals the intellectual links of that community from those who don't already see them. I trace this oddity to . . . the assumption that the natural unit of instruction is the autonomous course, one not in direct dialogue with other courses. The classes being taught at any moment on a campus represent rich potential conversations between scholars and across disciplines. But since these conversations are experienced as a series of monologues, the possible links are apparent only to the minority of students who can connect ideas on their own. (p. 4)

Graff (2003) elaborates on these ideas in his later book, *Clueless in Academe,* where he looks at our enterprise from the perspective of those "who don't get it," those for whom the life of the mind comes across as "a secret society for which only an elite few qualify" (p. 1). In contrast to this view, Graff (2003) writes about how we can give our students "access to forms of intellectual capital that have a lot of power in the world" (p. 9). My argument in this essay is that the task before us is not only to make our intellectual world visible and compelling to others but to offer powerful intellectual capital—both that which already exists as well as the opportunity to engage in generating more of it. Such work

will prepare our students for the world in which they will live. I argue that all of our students must integrate the insights and perspectives of the sciences into their growing understanding of the world and then apply that growing understanding to a series of issues of increasing complexity and importance. A good place to work out these connections and to design the continuum of experiences that can draw our students towards greater sophistication, purpose, and capability is in honors programs. In this intimate and controlled setting, knowledge can be made visible and compelling; at the same time, it can be put to good use as students make the challenging transition from the intentional and predictable environment of a college campus to the complex and ever-changing world beyond.

At its best, an honors program can become a working prototype of what all students should experience as intentional, empowered, informed, and responsible people ready to lead productive, responsible, and creative lives. In reality, however, many honors programs are built on a set of courses in which some integration is attempted within each individual course or seminar, but as in the larger curriculum of which honors is a part, there is often very little intentional alignment or connection from one course to another. Each course may be a dialogue but the whole still consists of a series of monologues.

Greater Expectations: A Work in Progress

The Greater Expectations panel cited previously learned from a set of innovative leadership institutions about how we can provide an educational environment that prepares our students for life and work in the 21st century. The result was a conception that emphasized linking learning to life in our curriculum, in our relationships with the community, and in our approach to scholarship.

The resulting report is built firmly upon a liberal education, a philosophy of learning that draws inspiration from challenging encounters with important issues and with difficult differences that make us question our ideas and assumptions about life. We must ask our students to join us in exploring the complexities of the human condition. Together, we can advance knowledge and put what we learn to good use in service to others.

In colleges and universities, we are doing our best to model the essential traits of an educated person: open-mindedness, informed judgment, and empathy. We seek to exercise moral imagination (Nussbaum, 2004) and to view with sympathy and understanding the

experience of people who live at a distance from us, or who look different from ourselves, or who have different values and cultural experiences. Such openness allows us to take seriously the lives of other people and to be concerned about their well-being. In a world connected now in new and intimate ways, the qualities of empathy and moral imagination are more important than ever, and our efforts to expand the international dimensions of the campus community and the scope of our international programs reflect our commitment to preparing our students and ourselves for the Conceptual Age. To articulate the educational philosophy offered by the Greater Expectations Panel (2002), the education we offer our students must prepare them to be *intentional learners* who are

- *empowered* through the mastery of intellectual and practical skills,
- *informed* by knowledge about the natural and social worlds and about forms of inquiry basic to these studies,
- *responsible* for their own actions and concerned for the public good.

What Have We Learned in Four Years of Exploration of Greater Expectations?

Since the publication of the Greater Expectations Report, AAC&U has partnered with a number of other organizations to probe more deeply into the core concepts that the panel articulated and to test the assumptions we made. The organizations have examined both the relevant literature on learning and teaching and the experience of the many institutions that have studied the report. They have also undertaken the task of studying the relevance of the ideas to their own institution, translating the work into locally meaningful terms and implementing changes in their approach to education, institutional design, and collaborations.

From these studies and reflections, several themes emerge:

A Contemporary Curriculum Must Incorporate Both Formal Study and a Reflection upon Life Experiences

As Andre Leskes wrote in her foreword to one of the Greater Expectations Academy in Transition series by Mary Taylor Huber and Pat Hutchings (2004), *Integrative Learning: Mapping the Terrain*: "While education has long been seen as a vehicle for learning how to integrate life experiences, formal study, diverse perspectives, and knowledge gained over time, the challenges of the contemporary world have

brought a new urgency to the issues of connection and integration" (p. iv). This essential integration is now envisioned as an especially effective path to producing learners for the 21st century who are "*intentional* about the process of acquiring learning, *empowered* by the mastery of intellectual and practical skills, *informed* by knowledge from various disciplines and *responsible* for their actions and those of society" (Leskes in Huber and Hutchings, 2004, p. iv).

The Curriculum Must Provide Conditions for the Fostering of Creativity

In the past several years, as observers of society have marked the onset of the conceptual age and the emergence of the creative class, creativity has become not the exclusive purview of a few gifted individuals. Rather, like the "science is for all" movement, we are seeing the gradual emergence of "creativity for all." Such a shift was catalyzed by Kay Redfield Jamison in *Exuberance: The Passion for Life.* According to Jamison (2004), "Exuberance is an abounding, ebullient, effervescent emotion. . . . It spreads upward and outward, like pollen toted by dancing bees, and in this carrying ideas are moved and actions taken" (p. 4). Although Jamison (2004) observed that true ebullience "is teeming in some and not to be caught sight of in others" (p. 5), what we see here is likely untutored creativity. Under the right conditions, all of us can reasonably expect to experience something akin to such an emotion, which takes hold when thought and action come together seamlessly, when true connections get made.

Picking up on the same theme, Steven Tepper (2006) likens the creative experience to the "flow experience" described by Csikszentmihalyi: "the sensation that individuals feel when they are fully engaged with a task in which they experience a sense of exhilaration and deep enjoyment while working through a challenge or puzzle with poise, skill and some level of mastery" (p. 6). According to Tepper (2006), the following conditions foster creativity and flow: "Creativity thrives on those campuses where there is abundant cross-cultural exchange and a great deal of 'border' activity between disciplines, where collaborative work is commonplace, risk taking is rewarded, failure is expected, and the creative arts are pervasive and integrated into campus life" (p. 4).

The Educational Experience Must Build across Time in Both Intellectual Complexity and Significance of the Outcomes

An essential feature of a practical liberal education is that it is neither confined to the general education component of a curriculum nor confined to the undergraduate experience. Integrative learning (Huber and

Hutchings, 2004) must be developed by serious attention to underlying connections and alignments of the different intellectual, social, and organizational structures of an institution. If such an aim were not difficult enough, a 21st-century curriculum also must have its roots in K–12 and its further realization in graduate study and the work of scholar practitioners. Curricular development is, in other words, a continuum that is held together by a rich conception of scholarship that includes students as well as faculty members, staff, and community members.

Learning Must Be Built on an Integrated Concept of Scholarship

In the past decade, we have experienced a fresh wave of thinking about the relationship between education and democracy and a careful examination of the concept of a public good and the role of higher education in contributing to democratic life and the practice of good citizenship. At the same time, we have begun to appreciate that the intellectual, social, and cultural demands of a truly global environment will place new expectations upon higher education. We must educate for a new age where the traditional categories of academic life—research, teaching, and service—must be integrated, both in the life of our faculty and in the experiences of our students. We must move beyond the boundaries that we have held so dear and explore new concepts of what it means to be educated in the 21st century and what it means to be a scholar and teacher.

A 21st-century curriculum must incorporate engagement and public scholarship. The experience of engagement will become the pathway to a fresh interpretation of the role of higher education in the 21st century. This conception rests on a rethinking of the core of the academy: the nature of scholarship itself and our expectations for the undergraduate experience. The goal of engaged scholarship is not to define and serve the public good directly on behalf of society but to create conditions for the public good to be interpreted and pursued in a collaborative mode with the community. In contemporary life, the exercise of citizenship requires constant learning and the thoughtful and ethical application of knowledge. By including our students in engaged scholarship, we introduce them to basic concepts and, at the same time, offer them a chance to explore the application and consequences of ideas in the company of mature scholars and practitioners.

For decades, the intellectual work of the academy has been artificially separated for purposes of evaluating the work of faculty in research, teaching, and service. Seen through the research lens, the practitioners of this type of scholarship can be called public intellectuals or public scholars. Seen through the teaching lens, this approach to

the curriculum and to our expectations casts faculty members as mentors. Seen through the service lens, the application of research to community problems changes from an outreach model of service delivery to a model of engagement. In outreach, experts apply well-researched answers to clearly characterized problems. In an engaged model, a group of people with complementary knowledge and skill work in a collaborative mode to create adaptive responses to often contested and poorly defined problems (the "swampy lowlands" of David Schoen, 1997, p. 3.)

Clearly, the dissection of the process of observation, action, and reflection into three separate facets of a scholarly life, either for faculty members or for students, is much too restrictive. The pattern does not foster the creative approaches that are needed in the world today.

We Must Practice What We Teach and Align Our Resources with Our Intentions

We cannot leave integration to chance or to the occasional flash of insight brought to the learning experience by the occasional student. Huber and Hutchings (2004) point out the power of aligning intentions, values, intellectual goals, working relationships, and infrastructure in developing and sustaining a truly integrated curriculum and student experience. They point out that a powerful alignment of structure, expectations, and rewards underlies the research mission of major research universities. A similar attention to the key elements of structure, reward, and measurement must accompany any plans to introduce a truly integrated and creative model of curriculum and scholarship.

Such a model does, however, "go against the grain" (Huber and Hutchings, 2004, pp. 3–4). As Huber and Hutchings (2004) put it, "Whether one is talking about making connections within a major, between fields, between curriculum and co-curriculum, or between academic knowledge and practice, integrative learning takes work" (p. 3). What then follows is a daunting list of current habits, assumptions, and behaviors that keep the elements separate rather than connected: the design of a bachelor's degree based on individual courses and credits, departmental structure, gaps between the liberal arts and the professions, the lack of clear faculty support and rewards for work that connects across traditional boundaries, the swirling patterns of enrollment in postsecondary education that make a coherent approach to education difficult.

The Role of Science in a 21st-Century Education: Scientific Literacy and the Claim that Science Is for All

Several years ago, Linstone and Mitroff (1994), wrote a compelling book: *The Challenge of the 21st Century: Managing Technology and Ourselves in a Shrinking World*. Their work was remarkably prescient. Linstone and Mitroff argue that a new century requires new thinking and the integration of three different frames of reference that are required to understand contemporary challenges. The frames are the technical or analytic, the organizational or institutional, and the personal or individual. Together, these three ways of looking at life call upon all of the liberal arts. They also give us a deeper understanding of complexity and usher us into the thinking required in a Conceptual Age (Pink, 2005). According to Linstone and Mitroff (1994), one way to avoid "taking any single model [of discovery] too seriously is to use several models instead of one. This also helps to overcome any one model's ever-present limitations, such as artificial boundaries, unwarranted assumptions, and oversimplifications" (p. 93). Hence, we can work on problems that are not "tame, docile or well structured" (p. 90). Such thinking does not come easily, even to the most integrative thinkers. It will not happen at all, I would argue, unless students explore the nature, assumptions, and limitations of all disciplines, both individually and in combination. My contention underscores why we must study the sciences within an honors curriculum and link that study with an intensive exploration of the humanities, fine arts, and social sciences and to the approaches those fields offer to solving problems.

A challenge faced by the academy today is that we have failed to keep the whole student in mind. As the National Association of Student Personnel Administrators (Keeling, 2004) argues in its white paper on "Learning Reconsidered: A Campus-wide Focus on the Student Experience," conceptions of learning must connect intellectual and personal development to reflect "the diverse ways through which students may engage, as whole people with multiple dimensions and unique personal histories, with the tasks and content of learning" (p. 3) in order to become mindful of their own approaches to learning, i.e., to become intentional learners. The white paper asserts: "A truly transformative education repeatedly exposes students to multiple opportunities for intentional learning through the formal academic curriculum, student life, collaborative co-curricular programming, community-based and global experiences" (NASPA, 2004, p. 3). Conditions like these establish patterns that can promote deeper

learning. Sharan Merriam (2005) has argued that transitions can offer the opportunity for learning and development. For this to happen, however, "an experience needs to be discomforting, disquieting, or puzzling enough for us not to reject or ignore it, but to attend to it and reflect on it. It is then that learning takes place" (p. 8). In a similar way, learning that is linked to genuine and passionate interest can be transformational and can generate the kind of creative response that 21st-century life will demand. Clearly, the kind of learning that we want to foster can occur only when heart and mind are both active; when intellectual, emotional, and social developments are considered together; and when the boundaries of the disciplines and the boundaries of university and community life are easily crossed.

Most honors programs still emphasize the humanities and the social sciences and either open up those frames to include the intellectual history of science or attempt to humanize the sciences by recognizing that much of human history has been shaped by technology and by the spirit of curiosity and discovery that has driven the development of explanations of ourselves, our environment, and the broader world in which we live. The focus is often on the development of scientific ideas rather than the application of a technological or scientific frame of reference, in combination with other disciplinary perspectives, to real-world problems. The time has come to give serious thought to "what understandings and ways of thinking are essential for all citizens in a world shaped by science and technology" (AAAS, 1989, p. xiii). As *Science for All Americans* (AAAS, 1989) argues:

> Education has no higher purpose than preparing people to lead personally fulfilling and responsible lives. For its part, science education—meaning education in science, mathematics and technology—should help students to develop the understandings and habits of mind they need to become compassionate human beings able to think for themselves and to face life head on. . . . America's future—its ability to create a truly just society, to sustain its economic vitality, and to remain secure in a world torn by hostilities—depends more than ever on the character and quality of education that the nation provides for all of its [citizens]. (p. xiii).

My deepest concern about honors programs in general is that they so rarely link scholarly inquiry to the challenges of responsible action in a world rich with unscripted and complex problems, the character of which often changes even as we contemplate the realities before us.

Our ablest students, especially, should experience life in a community of learners improving our world, the mission of my own institution, Winona State University. In the process of truly engaged learning, the difficult differences, the uncertain realities, the challenges to our own deepest assumptions come alive, and only then do we truly learn. Although any intense study of any field and any serious application of knowledge to problems that have consequences can offer the conditions for transformational learning, an experience that incorporates the different frames of human expression and personal experience, social and cultural context, and scientific and technological inquiry can provide an especially compelling and meaningful experience. Theory without practice, thought without action, individual aspirations without shared purpose, and participation without responsibility will not be enough. Our students deserve better of us.

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CHAPTER THREE: ENGAGEMENT IN LEARNING, LIBERAL EDUCATION, AND HONORS

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At the January 2004 annual conference of the Association of American Colleges and Universities (AAC&U), three members of the National Collegiate Honors Council (NCHC) presented a panel on Honors and Liberal Learning: Models of Success.[1] Our interest in doing so had to do with AAC&U's consistent commitment to liberal education. It had also to do with our sense that honors programs, as we know them, have everything to do with liberal learning, not only in the traditional definition of "arts and sciences" of the twentieth century, but equally in the sense of critical thinking and integrative learning emerging in the twenty-first century as hallmarks of the "new academy" that AAC&U embraces as the most recent incarnation of liberal learning in this country. The engaging conversation of our session at the national meeting confirmed that the historic function and nature of honors teaching and learning, which have existed independent of AAC&U, have mirrored the AAC&U's vision of liberal learning in the new academy.

The session began with participants' writing their personal definitions of liberal learning. Common to all were certain key expressions: liberating, exploring, thinking critically, connecting to civic responsibility, multidisciplinarity, thinking beyond borders. The consensus around expanding horizons, linking to civic engagement, engaging in reflection, and making discoveries so as to develop perspective and autonomy was marked.

Where mention was made of what portion of the undergraduate curriculum invited such exploration and independent inquiry, however, participants referred almost exclusively to core courses, the freshman year, and general education. The panelists took a slightly different position: that honors programs in their entirety provide a range of courses, opportunities for independent investigation, and practical immersion experiences throughout the undergraduate years. The honors model represents a profound as well as extended invitation to engage in liberal learning, in a pattern of courses, research, presentation, and direct social experiences that are broad

enough to embrace and transcend the development of expertise represented by primary disciplinary study.

We pointed to aspects of honors programs that promote and sustain key elements of liberal education, aspects such as the active learning that results from (a) the intentional pursuit of ways to set and solve problems, (b) a pursuit of making connections between and among subjects and between academic study and the world of work and public action, and (c) the need to integrate information and insights from disparate fields of inquiry. We highlighted the structural attributes of honors programs that foster nuanced active learning. These attributes include the fact that restraints often inherent in departmental pressures are absent once instructors are loaned to or acquired by honors programs. Assembled from many departments both within and outside Arts and Sciences, those teaching honors usually engage in ongoing planning and discussion about course objectives, discussion dynamics, and fruitful strategies for open-ended assignments, collaborations, and primary research.

Such discussions are broad-ranging because students in honors hail from many departments, as do their professors. As they construct a community around inquiry and engagement, they see themselves, importantly, as explorers on a team consciously seeking new territory. Often they forge new languages to do this, providing a kind of second investigative language for them: the more advanced their disciplinary study, the more invested they are in the analytical discourse of a discipline that is not necessarily shared by everyone in an honors seminar or honors working cohort. In short, the emphasis on pedagogical innovation and consciousness about learning dynamics, as well as the population pool in a general honors program that draws from everywhere on campus, combine to create a new entity: a liberal education population.

Carol Schneider (2004), AAC&U's president, in her address at the 2004 conference, called "the new academy" (p. 10) the emerging liberal education of this new century and characterized it in these ways: "Together, we are finding more powerful ways to teach students how to make sense of complexity; how to find, evaluate, and use new evidence; and how to apply their knowledge to real problems" (p. 11). She cites "innovations that are remapping the way we prepare students for responsible citizenship" (p. 11) and argues that "a strong focus on topics, curricula, and practices that teach students how to integrate their learning from different courses, different disciplines, and different kinds of experiences" (p. 12) is emerging.

Ways in which honors teaching and learning embody the practices to which Schneider refers include discursive teaching, almost always in small seminars where students must carry significant responsibility for the depth of insight generated by the course. Often primary research is involved: work not only in libraries but also in communities, businesses, and laboratories that yield problematic and contradictory information that the seminar participants wrestle with as part of their seminar interaction. Also, honors programs commonly offer or encourage service learning, international field experiences, and internships that reinforce students' sense of deep connection between themselves as students and the larger world in which they live.

Integrative learning—deriving from interdisciplinary courses, from thematically organized courses taught to students from many specializations, and from advanced honors seminars that presuppose registrants who carry with them an expertise based on study in depth—is an increasingly powerful component of the overall honors curriculum. NCHC itself fosters pedagogical experimentation: the City as Text™ strategy developed to help students hone observational skills, learn how to connect apparently unrelated information, and develop a sense of the importance of context and point of view is by now a pervasive model for immersion learning and reflective practices.[2] NCHC's national, even modestly international, membership broadens the spectrum of diversity considerably, adding regional and geographical diversity to the interdisciplinary mix that serves as intellectual context for educational development.

NCHC Honors Semesters are prime examples that build on (1) contextuality, (2) multidisciplinarity, (3) exploration, (4) research, (5) self-reflection, (6) integrative learning. Courses are drawn from several disciplines, and all focus on a theme especially appropriate to explore in the particular setting where the Honors Semester is offered. Semesters bring together students from many institutions and backgrounds, individuals who have differing academic interests and diverse cultural and geographical experiences. The students live together, engage in the deepest immersion learning possible, including extensive exploration laboratories and fieldwork, and benefit from the recurring reflective elements of the Semester structure to explore their own emerging and changing perspectives, which they must articulate during the Semester itself.[3]

The parallels between AAC&U's commitment to liberal education and the ongoing practices of honors programs are compelling. Yet when AAC&U began its joint project with the Carnegie Foundation for

the Advancement of Teaching—"Integrative Learning: Opportunities to Connect"—the applicant pool of colleges wanting to take part may reveal a gap between practice and perception (DeZure, Bobb, & Waldman, 2005). There were 139 applications for ten slots in the project. All applicants were obliged to provide "focal points" (p. 25)—or objectives for changing, developing, or strengthening practices on their home campuses—in order to participate. Fewer than ten proposals out of the entire pool identified "interdisciplinary studies and courses, advising, middle years and bridging courses, honors programs, and programs for transfer students" (p. 25) as areas in which campus investment had already begun for the particular benefit that could be derived from a project on *making connections*, the heart of liberal learning in this century.

Is this because honors programs already accomplish what those in our AAC&U session identified as "liberal learning"—going beyond borders, diminishing parochial views, preparing through practice/development of intellectual and social skills for productive engagement in civic and professional communities? Are honors programs already "interdisciplinary" and adept at developing "a sense of context," already "integrated" and "integrative," to borrow the language of our session participants at the AAC&U's 2004 conference? Or does the honors community itself not see clearly how extraordinarily honors programs—above all, general honors programs open to all disciplines—are arguably the most fully realized liberal education opportunities available today in higher education?

This matter is especially provocative in view of recent reports published on the performance of America's colleges. As Hacker (2005) points out in his review of six books about the quality of higher education, small colleges, which typically emphasize liberal education, rank high from students' viewpoints for engaging them in their learning and making the course material "come alive."[4] Despite the usually higher rankings of elite institutions and large state universities well-funded because of those rankings, Hacker reports that smaller liberal arts colleges are the ones appreciated most by students: "[S]atisfaction is highest in colleges that keep their enrollments small, don't have graduate programs, and are not necessarily nationally known. The lowest scores in the survey went to undergraduate instruction at large, well-known research universities" (p. 53). In settings where discursive teaching is part of every school term, where students from many disciplinary fields have access to one another as peers in theme-based courses or take interdisciplinary seminars, and where seminars are the norm, students

say that they feel challenged and involved. They feel that they are expected to think critically and to develop perspective and autonomy, and in such a learning environment whether or not they have done any of these things becomes apparent to everyone because the class setting is too small for any one person to remain invisible.

The closer the model of teaching and learning is to common practices in honors, the likelier that students are engaged in liberal education and the higher the correlation with their expression of satisfaction and excitement. Institutional support mechanisms embedded in the honors structural apparatus provide honors programs the capacity to shape themselves in ways that foster liberal education. The honors model implied here includes these attributes:

- Programs provide courses throughout the undergraduate years that unite small groups of students who otherwise would not develop discourse across their chosen disciplines and experiences or deal with thematic issues in extended work.
- Programs keep class size small to encourage interchange and intellectual independence.
- Programs challenge received opinion, developing a student's critical thinking about current, often as yet unsolved, problems.
- Programs expect collaborative primary research and presentation of research findings in order to foster communication and to generate discussion.

If evidence now suggests that students themselves appreciate those aspects of their education that are the most creative and intellectually liberating, we must acknowledge that honors education fundamentally nurtures exactly the sort of learning that students value as linking them to themselves and to the world, a linkage that AAC&U and honors itself call "liberal education."

Endnotes

[1]The 2004 conference "Practicing Liberal Education: Deepening Knowledge, Pursuing Justice, Taking Action," was held in Washington, D.C., January 21–14, 2004. Presenters for NCHC were John Zubizarreta, Bernice Braid, and Larry Clark.

[2]For a focused discussion of City as Text™ methodologies, see pp. 23–25 in Braid, B., & Long, A. (Eds.). (2000). *Place as text: Approaches to active learning*. NCHC Monograph Series. Lincoln, NE: National Collegiate Honors Council.

[3]For a useful resource on NCHC Honors Semesters and Faculty Institutes, see Machonis, P. A. (Ed.) (2008). *Shatter the glassy stare: Implementing experiential learning in higher education.* NCHC Monograph Series. Lincoln, NE: National Collegiate Honors Council.

[4]Books reviewed are *Privilege: Harvard and the Education of the Ruling Class* by Ross Gregory Douthat; *I'm the Teacher, You're the Student: A Semester in the University Classroom* by Patrick Allitt; *What the Best College Teachers Do* by Ken Bain; *University, Inc.: The Corporate Corruption of American Higher Education* by Jennifer Washburn; *The Best 357 Colleges, 2005 Edition* by The Princeton Review; *Profiles of American Colleges, 2005* by Barron's Educational Series.

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CHAPTER FOUR: DIALOGUE, POLITICS, AND PEDAGOGY: LESSONS FROM DEMOCRACY LAB

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So far as the pedagogy and politics of dialogue are concerned, we live in ironic times. Terminology from the small but growing dialogue movement has been widely adopted in the political realm. Politicians routinely talk about listening to the public and finding "common ground," but the actual content and processes of our political discourse seem unaffected. Calling for "dialogue" is more often a tactic for attacking the opposition than a genuine expression of political values. Partisan politics aside, the role of dialogue professionals and activists has expanded rapidly in community and organizational life because of the demonstrable educational power of dialogue. Mainstream educational thinking in schools and universities, however, has taken little notice.

The problem is not that educators are oblivious to political apathy and polarization, but calls for civic education are often resisted. The leading reason for resistance is an unwillingness to make what is seen as a necessary sacrifice of other more important learning objectives. Plus educators desire to keep politics out of the classroom. Although understandable, such motivations are largely misguided. As I argue throughout this paper, dialogic civic education requires no displacement of other learning but enhances it. Moreover, keeping politics out of the classroom simply cannot be done.

All pedagogy is political. All classrooms model norms of authority, the authority of students and teachers, the authority of knowledge, and the status of opinion. A classroom in which students are graded on their ability to report back correctly information and ideas contained in lectures and texts models a very different pattern of authority than one in which students are expected to question and are challenged to understand perspectives different from their own. Even in classrooms where attention is given to different points of view, if the emphasis is on learning who has taken what position and what reasons he or she has given, the implicit message continues to be one about the importance of knowledge. All classrooms model ways of learning. If the models are

primarily listening and reading, students are encouraged to see education as knowledge acquisition, what Freire (2003) termed the "banking concept" of education.

Thus, all education is civic education, even if only implicitly, preparing students for one type of citizenship or another. Barber's (1984) contrast between weak and strong democracy is helpful here. If citizenship is seen as primarily a matter of knowledgeable voting, what is sometimes called *weak citizenship*, then developing skills for receiving knowledge will be sufficient, perhaps coupled with some moral instruction about the citizen's responsibility to vote. On the other hand, *dialogic pedagogy*, especially student-to-student deliberative dialogue of the sort described below, prepares students for a different kind of citizenship, one in which citizens work together to define and accomplish public purposes. Dialogic pedagogy not only implies a participatory and deliberative model of citizenship but teaches the capacities and tastes such strong democratic citizenship requires.

All teaching implicitly communicates particular values. In these contentious times, educators are tempted to ignore the inherently political nature of education and to fall back on the traditional view of the unbiased scholar and professor, pursuing truth and enlightenment wherever it can be found. However, this stance of the neutral scholar assisting students in the acquisition of knowledge and critical-thinking skills communicates a powerful political message of a passive citizenship that is not a moral or civic responsibility but a purely personal choice or preference, what might be called *weak democracy*. Taking what I will argue is the untenable but common position that the classroom should be politically neutral reinforces the values of weak democracy.

Academic notions of expertise and professionalism perversely encourage pedagogical strategies that emphasize critique, render personal experience and feelings suspect, and implicitly classify students as receivers of knowledge. As Yankelovich (1991) has insightfully argued, our widely shared understanding of professional expertise as knowledge based and value-neutral undermines strong democracy by creating a separation between experts and citizens that legitimizes expert control and a limited role for citizens. That educational critics are always waiting in the wings to cite the standard of objective scholarship whenever they get wind of activities they find politically objectionable does not help. Horowitz and his Freedom Center's Campaign for Academic Freedom, for example, has spearheaded a national effort to involve state legislatures in protecting the "political neutrality" of higher education <http://www.horowitzfreedomcenter.org/FlexPage.aspx?area=campaigns>.

To say, as I am, that no pedagogy is politically neutral is not to say that one pedagogy is as defensible as another. Dialogic pedagogy brings its own unique understanding of objectivity and knowledge. It is a complex understanding, more adequate to the real world than naïve notions of professional neutrality, but less easily explained to students who often feel threatened by the notion that they will be graded on the expression of opinion. As we will see, learning through dialogue also helps students develop the capacity to deal with such complexities.

In the dialogue movement, a favored device for elaborating the core concept of dialogue is to contrast it with debate. Where debate is about persuasion and winning, dialogue is about understanding across difference and creating shared knowledge. While debate often dichotomizes issues, dialogue assumes that they are more complex and multi-sided. Dialogue facilitators typically find that participants are much more familiar with debate as a way of discussing controversial issues. Debate is not just the dominant model in the mass media, including the internet. Debate is also the dominant educational model of disputation on matters of opinion.

In the political world, opportunities for and encouragement of dialogue are scarce. As is widely observed, our polarized political culture is much better at fostering unreflective and unproductive invective, which is good for mobilizing the base but not for shedding light, than at encouraging dialogue. Shout radio and the blogosphere elevate ranting to an art form while modern life in our pluralistic society, from marketing to the internet, encourages retreat to real and virtual enclaves, increasing the society-wide need for understanding across difference while decreasing opportunities and diminishing our capacities for accomplishing it. Indeed, what we might expect to be paradigmatic of democratic dialogue, campaigning for public office, is too often a matter of deceit and manipulation as negative campaigning increases from election to election.

The American emphasis on individual rights and limited government has contributed to what might be called radical subjectivism. In this often arrogant and sometimes obstreperous view, my opinion is valid because I hold it, and I am under no obligation to consider other points of view. Indeed, I may shout my opinions from the rooftops without incurring any obligation to defend them in public terms. My opinion is as good as any other because it is mine.

Mattson (2006) provides insight into the central role of this subjectivism in both politics and education. Mattson discusses its association with postmodernism as well as with the 1960s counterculture and its manifestation across the ideological continuum. His identification of

what is needed to repair our political culture illuminates the key role of civic dialogue. What is needed, Mattson argues, is "to make clear that a world in which everyone simply reconfirms their preexisting opinions by going to their own ideological media source or by refusing to listen to arguments they don't like in the classroom is not a world in which democracy will flourish" (2006, p. 30).

Higher education may have actually prepared citizens to be part and parcel of this polarized political world. Perhaps not coincidentally one of the more successful movements in higher education during the last three decades has focused on the integration of critical thinking into the curriculum. Debate and the techniques of debating are widely taught, and approximately 200 colleges and universities send teams to the National Parliamentary Debate Association's annual competition <http://cas.bethel.edu/dept/comm/npda/index.html>. Instruction in critical thinking and debate are part of the educational mainstream. On the other hand, dialogue is a very different mode of communication and learning. It comes with its own literature base that is at least as deeply grounded in philosophical, linguistic, and pedagogical research as is debate. Dialogue is not, however, widely understood in educational circles; its impact is dwarfed by debate. In contrast to the National Parliamentary Debate Association, the recently formed International Institute for Sustained Dialogue claims only a dozen or so high schools and colleges as members <http://www.sustaineddialogue.org>.

There is good reason to expect that dialogic pedagogy has a brighter future in honors than in higher education generally. One of the hallmarks of honors education is the replacement of large lectures with smaller classes operating in a seminar format and emphasizing student discussion. Dialogue among students and teachers drives many of the pedagogical innovations prized in honors education. City as Text™ relies on dialogue among team members to share and process the results of observation. Collaborative learning relies on student-to-student dialogue to accomplish specific learning tasks. Learning communities encourage informal dialogue among students as a general support for cooperative learning.

In honors and non-honors teaching and learning alike, however, little focused attention has been given to the dialogic learning process itself. When dialogue is discussed as a teaching strategy, the relevant model is usually teacher-directed Socratic dialogue. Even in honors classrooms that feature student discussion, student-to-student dialogue is rarely at the center of a course, shaping its content and directing the learning process. Interestingly in this regard, we can compare the current version

of "Basic Characteristics of a Fully Developed Honors Program" and the 50-year-old version from the Inter-University Committee on the Superior Student recently discussed by Rinn (2006). (See <http://www.nchchonors.org/basichonorsprogramcharacteristics.aspx> and Appendix A.) While the current version has much more to say about administration than about pedagogy, the older version specifically recommends "elimination of lecturing and passive note taking" (p. 75).

An increasingly visible, organized, and committed movement supporting the use of dialogic strategies in the public realm exists, with the National Coalition for Dialogue and Deliberation perhaps its most diverse and inclusive representative. Higher education, however, offers no analog and certainly no movement. Numerous allied initiatives and innovations persevere, some within honors, some not, but the pedagogical value of dialogue is even less appreciated than its political value. The peculiar irony of this situation lies in the fact that dialogue gains its political value precisely from its capacity to educate. Much in the national political context and in the wider educational context, however, runs counter to dialogue as an educational strategy, predisposing students and faculty away from dialogue and toward debate, away from understanding across difference and toward critique, away from exploring personal experiences and concerns and toward a narrowly cognitive understanding of learning.

Political culture shapes what happens in higher education through its effect on the skills and expectations students and faculty bring with them, especially on their underlying assumptions about the purpose of education and the nature of learning. Entering college students have been bombarded with exhortations citing the economic importance of earning a college degree. They naturally see college as certification for a specific type of employment and to consider their time and effort as the price of obtaining a degree. Student concern for learning drops out of the picture as this narrow cost-benefit analysis impoverishes education.

Again, what about the effect of our particular approach to college education on the larger society? Could college education itself be a part of our political problem? Could our emphasis on critical thinking, on content knowledge, and on distinguishing subject matter learning and professionalism from personal opinion be helping to produce political polarization and alienation? Finally, might an infusion of dialogic pedagogy enhance the educational experience of our students while building support for a dialogic political culture and the strong citizenship our democracy sorely needs? While this issue is one for all of higher education, it may also be one for which honors is particularly well suited to take a leadership role.

Is College Education Part of the Problem?

There is good reason to believe that dominant educational methods have contributed to the polarization and acrimony of our public discourse. While this claim is admittedly one of those complex hypotheses that defies testing, one can safely say that higher and secondary education are not doing enough to advance a counter model of public discourse. The failure to expose students to positive models of dialogic discourse is readily apparent at the high school level. Summarizing their personal observations in high schools and their review of other studies, Hess and Posselt (2002) report that "few students seriously study controversial issues, and group discussion appears not to be a prominent instructional mode" (p. 287). Their study of 135 Chicago public middle and high school classes, for example, found controversial issues being studied in only 8.1% of classes. While college classrooms certainly offer much more discussion of controversial issues than high schools, such interaction frequently is handled in ways that reinforce the cultural problem. The importance of how discussion of controversial issues is handled can be seen more clearly by considering patterns of cognitive development in the college years and their relation to political culture.

Although an extensive body of research exists on the relationship between education and cognitive development, especially at the college level, such literature seems to have affected pedagogy only at the margins. Beginning with Perry's groundbreaking work in 1970, research has established a fairly detailed portrait of typical patterns of cognitive development as they relate to age and education. Most high school and entering college students bring into the classroom a naïve understanding of education as just the acquisition of factual knowledge. With little understanding of the complexity and contextual basis of all knowledge, they often regard questions that do not have clear right and wrong answers as totally subjective. In the stage Perry called "dualism," knowledge is understood in terms of a division between true facts and subjective opinions. Seen through this epistemological lens, all opinions are equally valid: my reasoning is valid for me, yours is for you, and insularity ends the discussion. I daresay we have all encountered this scenario in the classroom. As Mattson (2006) points out, we encounter these same epistemological assumptions in the radical subjectivism characteristic of political discourse.

Much that happens in college classrooms, I believe, not only fails to promote development of more sophisticated understanding but frequently reinforces the dualistic assumptions students bring with them.

While higher cognitive processes are often the subject of both water-cooler conversations and course syllabi, much, perhaps most, instruction and grading focuses on the transmission of knowledge. Of course, we can detect variation among disciplines and among instructors, but the large role typically played by lectures and multiple-choice tests rewards memorization rather than the development of thoughtful opinions and the capacity for judgment. This emphasis on gaining knowledge implicitly supports the dualist's division of the world into facts and purely subjective opinion. Since instructors often feel pressured to cover material, they cannot avoid communicating the sense that the realm of facts is simply more important than the realm of opinions. Since the material primarily consists of information and theories produced by others, especially experts, student opinions are consigned to a kind of time-out space, something we can waste a few minutes on as long as we are up to date studying what matters.

The question of relative importance aside, a common classroom and textbook approach to controversial issues begins by identifying them as matters of opinion. While instructors and authors are in varying degrees quite aware of the interconnectedness of expert knowledge and opinion, they often implicitly or even explicitly identify a bright line between their own knowledge and opinions. Sometimes this rhetorical move is part of an effort to reassure students that the instructor's or author's personal opinions will not be allowed to bias the presentation of expert knowledge, a perfectly reasonable motive. Sometimes such messages are simply a way of reminding students that they must focus on the knowledge to be learned. Part of the problem for teachers is the complexity of reality. The real-world nexus of fact, interpretation, and values in all thoughtful and informed opinions simply cannot be dealt with in classes not devoted to that subject. The time is insufficient. Nonetheless, implicit or not, methods that reinforce dualism impede the cognitive development of students.

The other side of dualism is a deep suspicion of all presentations of knowledge in a political context. If all opinions are subjective, and if partisans are presenting information, the information itself can be treated as mere opinion. Citizens or public officials who assume that all facts presented in a political context are slanted and equally suspect are free to disbelieve those facts. Similarly, those who grant the objective validity of facts and professional knowledge but assume that opinions are radically subjective can only end up shouting at each other about issues of public policy or, at best, taking votes to see who wins and who loses. In either case, the potential for reasoned dialogue on issues that

matter to the community is subverted. So learning the skills of democratic discourse and developing a taste for and commitment to deliberation about the common good require development beyond the epistemologically inhibiting assumptions of dualism. Looked at from the perspective of Perry's work, we might observe that our political culture suffers from adolescent epistemological assumptions and stunted capacities for public judgment.

While the considerable attention given at the college level to the development of critical-thinking skills can mitigate the emphasis on acquiring knowledge, it carries its own risks because of its one-sidedness. Students with dualistic assumptions are likely to see critical-thinking skills as so many weapons to be marshaled in the battle between holders of different opinions. Students can become skillful debaters, doing well something their teachers seem to care about, without questioning their own assumption that all opinions are subjective. Realizing the full potential of instruction in critical thinking requires combining it with training in the very different skills of understanding across difference. Embracing these contraries, as Elbow (1986) has put it, is the particular genius of dialogic pedagogy.

Dialogic Pedagogy

Seventeen years in honors showed me that we should be doing much more with dialogic pedagogy than we are. My gradual introduction of dialogic strategies in the classroom and later their role in Democracy Lab, which will be described below, convinced me that student-to-student dialogue belongs at the heart of education. The central role played by dialogue in our involvement of all honors students in governance of the Lock Haven University Honors Program demonstrated the powerful role dialogic learning can play outside the classroom and in the activities of citizens. Although I started with the notion of dialogue as a helpful supplement to traditional instruction, I came to see it as an alternative and superior pedagogy. I became increasingly convinced of the potential of dialogic pedagogy to improve political discourse while enhancing achievement of traditional goals of liberal learning.

Although not, strictly speaking, part of the literature on dialogic pedagogy, Elbow's *Embracing Contraries* (1986) has much of value to say about the kind of college teaching we need. Elbow identifies a number of contraries, such as that of coach and critic, both sides of which, he argues, must be fully embraced if one is to achieve excellence as a

teacher. One contrary that I have found to be particularly pertinent to dialogic learning is that of empathic and critical thinking. While critical thinking is routinely considered to be essential in higher education, the equally important role of empathic thinking is much less discussed or appreciated.

In order to acquire the skills of critical thinking, even when considering views with which they agree, students must learn to suspend their belief, to hold it in abeyance in order to reflect critically on the opinion. Just as necessary, Elbow argues, is the ability to suspend disbelief in order to understand, an effort equal to suspending belief in order to critique. Operating from a similar insight, Wells (1999, 2001), a leading researcher and theorist of dialogic pedagogy, argues that critique alone is deficient because of its inability to understand truly what it is critiquing. True understanding can only be achieved through empathic thinking, which requires a willingness to suspend disbelief in order to understand truly. Opinions can be fairly critiqued only if they are understood from the inside.

While dialogic pedagogy is a recognized if minor strand of research and practice at the elementary and secondary level, in higher education it is hardly on the radar. An excellent introduction is Wells's *Dialogic Inquiry* (1999). Even though Wells's experience and research are at the elementary level, his understanding of dialogic pedagogy is directly relevant to higher education. At all educational levels, dialogic pedagogy with student-to-student teaching and learning can help students find their own authentic engagement in learning by connecting thinking and feeling and by linking personal and educational lives. It can enrich and deepen the educational experience by enabling students to find value in the process itself rather than seeing it as a required means to an end.

"My central argument in this book," Wells (1999) states in his introduction, "is that education should be conducted as a dialogue about matters that are of interest and concern to the participants" (p. xi). He goes on to point out that this is a matter of how students are educated and not inconsistent with the goal of "equipping students with the knowledge and skills that are culturally valued" (p. xii). Drawing on Vygotsky's social constructivist theory of learning and development and Halliday's functional analysis of language, Wells elaborates a dialogic pedagogy that he sees as transcending the debate between proponents of progressive, child-centered education and those advocating a teacher-directed return to the basics:

> In the place of traditional transmissional teaching, on the one hand, and unstructured discovery learning on the other, [Vygotsky's] theory places the emphasis on the co-construction of knowledge by more mature and less mature participants engaging in activity together. . . . In the place of competitive individualism, his theory proposes a collaborative community in which, with the teacher as leader, all participants learn with and from each other as they engage together in dialogic inquiry. (p. xii)

Dialogic learning, as presented by Wells, emphasizes what I call process learning rather than content learning, but certainly not to the point of exclusion. A more familiar phrase may be "learning to learn." Educators expect students to create and use knowledge, not just possess it. This venture is, of course, risky. Commenting on the often mixed results of students' efforts to perform collaborative speaking or writing activities, Wells (1999) states:

> What is important, in my view, is not whether the texts that are the outcome of such collaborative discussion conform to some abstract prescription of 'report' or 'explanation'—a result that could be produced by filling in spaces in a pro-forma document—but that they have the form they do because the writers have made conscious decisions to construct them in that way in order to achieve the purposes that they have set for themselves. (pp. 154–55)

In other words, process learning requires throwing students into the water where they will learn by doing. The all-too-common approach of converting the process into a protocol for students to follow simply substitutes content learning for process learning. Learning recipes is just another version of memorizing content, less risky than being thrown in and much less rewarding.

A critical concept for the theory and practice of dialogic pedagogy is the "zone of proximal development" (ZPD), originated by Vygotsky (1978) and defined as "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance or in collaboration with more capable peers" (86). As the definition indicates, the ZPD is applied to process learning, to the development of problem-solving capacities. Using the ZPD focuses attention on ways of guiding and facilitating activities, the experience of which will increase the capacity of students to work independently of

that guidance and facilitation. Furthermore, Wells thinks of the ZPD in social as well as individual terms: "In other words, the zone of proximal development is *created in the interaction* between the student and the coparticipants in an activity, including the available tools and the selected practices, and depends on the nature and quality of that interaction as much as on the upper limit of the learner's capability" (p. 318; emphasis in original). Dialogic pedagogy focuses on developing learning communities, not just on educating individual students.

King's (2002) research with her own high school students looked at students "working together to solve ill-structured problems" as an example of a group peer-learning task that "demands high-level cognitive processing" (p. 33). She observes that for "high-level complex learning to take place, the thinking and interaction within the group must also be of a high cognitive level, characterized by the exchange of ideas, information, perspectives, attitudes and opinions. [But] this kind of thoughtful interaction does not occur spontaneously. Without teacher intervention to structure the group interaction . . . students working in groups appear to be more focused on finding the right answers than on learning" (p. 34). King calls her method of intervention "guided reciprocal peer questioning" (p. 34). The process requires students to formulate questions for each other using generic question stems such as "What is the meaning of—?"

Simon's (2003) study of moral education in three high schools found that productive student-to-student dialogue was most often triggered not by teacher intervention but by an authentic question raised by another student. Authentic questions, Simon emphasizes, are those motivated by a genuine desire to know rather than by teacher pressure to engage in a particular kind of discussion. King (2002) and Simon (2003) agree that student-to-student dialogic learning is key to genuine student engagement in the learning process.

Dialogic methods are likely to deepen student learning and engagement by contributing to a sophisticated understanding of learning and the development of higher-order intellectual capacities. They also bridge the common disconnect between classroom learning and the real experience and concerns of students. Student-to-student deliberative dialogue on public issues can advance both liberal learning and civic education goals in a wide variety of courses at all levels of instruction.

Experience with Dialogic Methods

Honors educators, whether familiar with the literature surveyed here or not, will probably find much in it that is reflected in their own teaching; however, I believe the specific teaching strategy of student-to-student dialogue is much less widely used than it ought to be, even in honors education. As a way of further elucidating dialogic methods and recommending experimentation with them, I would like to share my experience in Democracy Lab, in the honors and non-honors classroom, and in the Lock Haven University of Pennsylvania Honors Program.

Democracy Lab

Democracy Lab online learning communities are designed to further the traditional objectives of liberal arts learning and to develop citizens for strong democracy (Knauer, 2005). Recently the Association of American Colleges and Universities (AAC&U), in its major study, *Greater Expectations: A New Vision for Learning as a Nation Goes to College* (2002), called for "a dramatic reorganization of undergraduate education to ensure that *all college aspirants* receive not just access to college, but an education of lasting value" (emphasis added).[1] Participation in Democracy Lab forums involves students in many of the specific learning activities the study identifies as essential to helping all students become "intentional learners" who are "purposeful and self-directed" and "can adapt to new environments, integrate knowledge from different sources, and continue learning throughout their lives" (2002, Ch. 3).

Here again, we see the fit between the objectives of liberal education and the demands of strong democracy. Intentional learners are what strong democracy requires. By placing dialogic learning at the center of students' online experience, Democracy Lab teaches them new ways of thinking and communicating. Yankelovich (1991), one of the early and deepest thinkers about the role of dialogue in civic learning, observed: "For democracy to flourish, it is not enough to get out the vote. We need better public judgment, and we need to know how to cultivate it. The public is not magically endowed with good judgment. Good judgment is something that must be worked at all the time and with great skill and effort. It does not exist automatically; it must be created" (p. 11). Democracy Lab fosters the development of intentional learners with the capacity for public judgment.

What we have learned about dialogic pedagogy in the online environment of Democracy Lab may be helpful for any instructor considering experimenting with dialogic learning strategies in the classroom or in other course activities and assignments. The following description

of Democracy Lab is intended both to clarify exactly how dialogic learning is structured and facilitated on Democracy Lab and, more generally, to identify specific learning opportunities provided by student-to-student dialogue.

Each Democracy Lab forum has its textual basis in an issue framework. These non-partisan frameworks lay out a broad social issue and present three or four perspectives or approaches. Each perspective represents a different understanding of the issue, identifying underlying causes, value priorities, a broad course of action, and some specific policy and citizen-action proposals. Arguments and evidence in support of and critical of each perspective are also included.

Racial and Ethnic Tensions: What Should We Do? from the National Issue Forum Institute <http://www.nifi.org> and the Kettering Foundation <http://www.kettering.org> has been a particularly successful issue framework. It identifies the issue as persisting racial and ethnic conflict and offers three perspectives for consideration. First, looking beyond race and ethnicity by focusing on what unites us, and ending racial preferences in order to provide equal opportunities and treat everyone the same. Second, building the self-identity of minority groups by accepting cultural differences, and allowing "minority communities and schools to set their own course." Third, opening all doors to everyone by finishing the job of integration, relying on the experience of living, working, and going to school together to reduce prejudice. The full text of this framework is available at <http://www.nifi.org/discussion_guides/guides.aspx?catID=8>. Other sources of issue frameworks include Public Agenda <http://www.publicagenda.org>, Study Circles <http://www.studycircles.org>, the Choices program in the Watson Institute for International Studies at Brown University <http://choices.edu>, and many other groups, including Democracy Lab students, that have framed local and national issues for public deliberation.

Democracy Lab online deliberation takes place in small groups of 12–20 students drawn from several different schools. Asynchronous bulletin boards with pre-set threads for several dialogue tasks are available 24/7 for the entire ten-week forum. Students are expected to devote two hours per week to the forum and to spread their participation over at least four days. In their small groups, students interact primarily with students from other schools who are taking classes in disciplines different from their own. A group might include courses in political science, communications, journalism, history, philosophy, social work, and education. The demographic and disciplinary diversity of

Democracy Lab dialogue groups increases and enriches opportunities for student-to-student teaching and learning. The range of personal experiences and the variety of course materials relevant to the topic become opportunities for sharing, questioning, explaining, and integrating. All dialogic pedagogy depends upon differences among participants. While almost any student group will provide a sufficient diversity of experiences and perspectives to make dialogic learning possible, Democracy Lab multiplies these opportunities beyond what can be achieved in any one classroom.

While most approaches to deliberative dialogue, such as National Issues Forums and Study Circles, depend on the constant presence and guidance of trained facilitators, Democracy Lab groups are self-moderated but guided by announcements and instructional modules. The pedagogical point of such practice is to provide students a more powerful learning experience. Democracy Lab is essentially a kind of experiential learning in which students are assigned specific tasks in the weekly announcements, taught specific methods in the instructional modules, and then given the opportunity to practice and develop those skills on their own, learning from each other in the process.

The ten-week forum agenda starts with personal introductions and sharing of experiences related to the issue. Then, students weigh the pros and cons of each approach and identify questions for further inquiry. Guidance is provided for conducting and reporting research and for discussing its significance. Finally, students are encouraged to reflect on the learning process and to identify action possibilities. The weekly instructional modules teach specific dialogic learning tools. The process begins with a detailed distinction between deliberation and debate. Where debate emphasizes attacking an opponent and winning, deliberation emphasizes listening to those with different views in order to understand them. Ensuing weeks emphasize different stages in the deliberative learning process. At the outset, students are encouraged to share personal experiences that have shaped their feelings and ideas on the issue. By laying this narrative foundation at the outset, groups immediately develop a personalized understanding of each other and the issue. As they move to formal arguments and consideration of more general and less personal information, this narrative foundation helps students maintain an awareness of the personal meaning of the issue for themselves and for other members of their group. It strengthens their involvement as intentional learners.

Another lesson teaches ways of asking questions of those with very different, even seemingly repellent views. Debaters' questions designed to trip up opponents are contrasted with friendly questions designed to

deepen understanding. Students are encouraged to respond frankly to questions, revealing their own uncertainties and ambivalences rather than covering them up. The underlying lesson here is using deliberative dialogue to learn about ourselves and others rather than to persuade or to attack. In particular, students are charged to come to a deep understanding of why others see things differently than they do.

This deepened understanding of difference is used, in turn, to teach students inquiry methods. Here, the dimension of critical thinking comes to the fore. Probing for underlying assumptions, students formulate inquiry questions, the answers to which would help them evaluate competing views and their own. This lesson distinguishes different types of questions to help students clarify their thinking and describe precisely the kind of information they need to uncover. The following lesson shepherds the process along, providing guidance for finding and evaluating information on the web, reporting the information, and deliberating on its significance.

Three times during the forum, groups are charged to prepare a group report to be shared with other groups considering the same issue. While announcement and instructional modules focus directly on the deliberative learning process, the preparation of group reports puts students in a meta-reflective position, requiring them to review what they have accomplished to that point and report it to other groups. In addition, the reports intensify the group learning experience by forcing the group to self-organize for the specific task at hand. While results are somewhat mixed, they always "have the form they do because the writers have made conscious decisions to construct them in that way in order to achieve the purposes that they have set for themselves," to return to the point quoted earlier from Wells (1999, pp. 154–55).

Thus the experiential-learning process guided by such instructional modules and group reports uses the deliberative dialogue context to help students develop as intentional learners. In terms of the zone of proximal development (ZPD), the deliberative learning process in Democracy Lab provides adult guidance in the form of dialogue-guiding announcements and focused instructional modules. The process also brings together such a diversity of students that each student will find more capable peers on one or another aspect of the learning activity, especially given the combination of substantive and process learning involved. The result is a learning activity that meets each student in his or her own ZPD with appropriate challenge and support. This is especially true for those students whose course instructors devote some

class time to meta-dialogue about the online learning activity. The additional reflective discussion in a different setting with different participants provides yet another set of learning opportunities. As emphasized in Democracy Lab instructor workshops, the success of online dialogic learning is heavily dependent on the ways in which instructors design their courses and employ classroom strategies that maximize the opportunities for students to transfer learning from the course to the online dialogue and from the online dialogue back into the classroom.

Democracy Lab is an excellent practicum experience for students and instructors. Dialogue groups are largely student run. To a significant extent, students decide what they will learn. Although the issue framework and individual course materials set the overall content agenda, within those parameters what students discuss and research in their online groups is determined by their own interests and concerns. The dialogue groups may be virtual, but they are more real-world than the classroom: students are on their own, interacting with people and ideas not introduced by their instructors. Thus, the online dialogue provides instructors with a window for viewing what their students can do with their learning. Finally, instructors have the opportunity to bring their observations back into the classroom as object lessons for further learning.

Having now reviewed Democracy Lab techniques in detail, educators can more fully appreciate their connections with AAC&U's "intentional learner" model. Especially in the area termed "intellectual and practical skills," the relevance of dialogic process learning is striking. Dialogic learning exercises every one of the component skills identified in the study:

- Communicating in diverse settings and groups, using written, oral, and visual means, and in more than one language;
- Understanding and employing both quantitative and qualitative analysis to describe and solve problems;
- Interpreting, evaluating, and using information discerningly from a variety of sources;
- Integrating knowledge of various types and understanding complex systems;
- Resolving difficult issues creatively by employing multiple systems and tools;
- Deriving meaning from experience, as well as gathering information from observation;

- Demonstrating intellectual agility and managing change;
- Transforming information into knowledge and knowledge into judgment and action;
- Demonstrating intellectual agility and managing change;
- Working well in teams, including those of diverse composition, and building consensus. (AAC&U, 2002, Ch. 3)

Honors Program and Beyond

Students in the Lock Haven University Honors Program learn strong citizenship by doing it. All students contribute two hours per week to the honors learning community. Student leaders design and implement a wide variety of educational activities, nearly all of which involve students in discussion related to course work and to other matters of interest to them. Entering students follow a set schedule of activities designed to introduce them to the learning community. Returning students select activities of interest, and most of them assume specific leadership responsibilities. Leaders of the various activities, teams, and committees report to one of the three student associate directors and participate in the Program Coordinating Committee. Student-to-student dialogue permeates and informs the honors experience, linking curricular and co-curricular experience and engaging student interests. One student-run activity is the Public Issues Forum Team, which runs public forums on issues of general concern three times a semester and trains student facilitators for the forums. One forum run every fall for the particular benefit of new students is entitled, "What Kind of General Education Should All Students Have?" Typical of the dialogic approach, rather than preaching to students about how they should approach their education, this issue presents students with four approaches and asks that they consider the relative merits of each. Students become strong citizens in the honors learning community, contributing to a shared vision of the common good and working together to achieve that vision. Enacting strong citizenship, in turn, contributes to the development of intentional learners.[2]

The educational power of dialogic and engaged community to reach students is attested to by the fact that 93% of students entering the program return to the university for their second year. Furthermore, a unique expansion of the honors program in 1999 demonstrated the wisdom contained in the phrase "honors for all students." Beginning in that year, fifty additional first-year students were granted one-year provisional admission based on their desire to be in the program, regardless of their credentials, so long as they qualified for regular admission

to the university. Grouped in designated sections of regular freshman courses rather than honors courses, they were immersed in student-run honors co-curricular activities. In spite of the fact that many of these students placed in the bottom half of the incoming class in terms of test scores and high school grades, after three years of perfecting the new program, 90% of students who enrolled were returning to the university for a second year. In addition, many of these students, on the basis of their college work, became full members of the honors program and assumed leadership positions.

This experiment with providing honors opportunities for all students suggests that the widely observed accomplishments of honors students may be less the result of their superior qualifications and more than is often appreciated the result of the special honors learning environment. The flipside of this observation is that the added value provided by the honors experience might be even greater when provided for less-qualified students. In the Lock Haven Honors Program, the gain in retention at the university was three times as great for the average students as it was for the students with the highest credentials. What non-honors students may really need is the challenging and supportive, high-expectation environment typical of honors rather than programs appropriate to their credential levels.

Other evidence attests to the wisdom of opening honors to all students and engaging all students in dialogue. A recent study of liberal arts education found that " liberal arts experiences and a liberal arts emphasis were most important for students of color and students with below average pre-college academic ability" (Wolniak, Seifert, & Blaich, 2004). Philosophy for Children, a marvelous dialogic curriculum for K–12, has its greatest impact on reading skills for students reading below grade level, although I first encountered it in a middle school gifted program library (Allen, 1988). The reasons for questioning common assumptions about links between student credentials, honors, and appropriate pedagogy are compelling. Dialogic pedagogy may be the key to challenging those assumptions and bringing honors to all students.

Honors programs and the National Collegiate Honors Council have already played a central role in the development of dialogic pedagogy. Individual directors, such as David Mowry at SUNY Plattsburgh and Dane Partridge at University of Southern Indiana, have used the National Issues Forum model of deliberative dialogue in honors classes for years. The NCHC partnership with the Kettering Foundation in the 1990s introduced many in honors to the NIF model and led to incor-

porating public issues forums at annual meetings. NCHC support of the pilot for Democracy Lab was critical to its development, bringing the talents and energies of dozens of honors faculty into that effort. Other programs, such as the one at the University of Georgia, have given public issues forums a prominent place.

Conclusions

American individualism imposes a pricey cognitive tradeoff that dialogic learning can mitigate. Our treasured right to our own opinion easily morphs into and legitimizes the kind of radical subjectivism that underlies political polarization with its discourse of attack and spin. Not only does deliberative dialogue support the development of sophisticated epistemological understanding, but it can even seduce committed individualists into a mode of discourse that engages because of its greater humanity, because it connects our individual lives to the lives of others and to the common concerns and projects that tie us together. It is the discourse of strong democracy, the discourse of liberal learning.

All pedagogy is political. Choosing pedagogies is risky and consequential business. Dialogic pedagogy educates for strong democracy, while the training and credentialing of experts prepare students for representative democracy and weak citizenship. Narrow, careerist education prepares for niche-life as a technical expert, while liberal learning empowers lifelong learners to join the broader human community. In the current political and cultural context, educators have good reasons for being reluctant to admit the deeply political nature of any choice of pedagogy, just as we have good reasons for avoiding controversial public issues in the classroom. We face, along with other professional experts in our culture of weak democracy, a temptation to clothe ourselves in the mythical attire of professional objectivity.

While honors educators are particularly likely to understand the value of dialogic methods, the value of dialogue is not limited to the honors curriculum. In fact, dialogic pedagogy may be one of the best examples of how honors programs should be more aggressively pursuing honors as laboratory and honors for all students. Honors must lay claim to leadership of a broad reform movement in higher education based on dialogic pedagogy. Claiming such leadership involves a willingness to move beyond emphasizing the special qualifications of honors students and focusing instead on what they have in common with average students. Dialogic learning fosters a strong citizenship to revive

our weakening democracy. It promotes integrative learning to repair our hyper-specialized and fragmented undergraduate curriculums. The NCHC and honors programs and colleges across the country are well supplied with the talent and experience needed to lead such a movement.

Endnotes

[1]For more discussions in this volume of connections between honors education and AAC&U initiatives, see Ramaley's "Toward a Model of Integrative Learning: The Place of Science in an Honors Curriculum" and Braid's "Engagement in Learning, Liberal Education, and Honors."

[2]This description draws on Knauer (2004). Specific facts reflect the status of the program at the time I stepped down as director, in December 2004.

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APPENDIX A

Basic Characteristics of a Fully Developed Honors Program

No one model of an Honors program can be superimposed on all types of institutions. However, there are characteristics that are common to successful, fully developed Honors programs. Listed below are those characteristics, although not all characteristics are necessary for an Honors program to be considered a successful and/or fully developed Honors program.

- A fully developed Honors program should be carefully set up to accommodate the special needs and abilities of the undergraduate students it is designed to serve. This entails identifying the targeted student population by some clearly articulated set of criteria (e.g., GPA, SAT score, a written essay). A program with open admission needs to spell out expectations for retention in the program and for satisfactory completion of program requirements.
- The program should have a clear mandate from the institutional administration ideally in the form of a mission statement clearly stating the objectives and responsibilities of the program and defining its place in both the administrative and academic structure of the institution. This mandate or mission statement should be such as to assure the permanence and stability of the program by guaranteeing an adequate budget and by avoiding any tendency to force the program to depend on temporary or spasmodic dedication of particular faculty members or administrators. In other words, the program should be fully institutionalized so as to build thereby a genuine tradition of excellence.
- The Honors director should report to the chief academic officer of the institution.
- There should be an Honors curriculum featuring special courses, seminars, colloquia, and independent study established in harmony with the mission statement and in response to the needs of the program.
- The program requirements themselves should include a substantial portion of the participants' undergraduate work, usually in the vicinity of 20% to 25% of their total course work and certainly no less than 15%.

- The program should be so formulated that it relates effectively both to all the college work for the degree (e.g., by satisfying general education requirements) and to the area of concentration, departmental specialization, pre-professional or professional training.
- The program should be both visible and highly reputed throughout the institution so that it is perceived as providing standards and models of excellence for students and faculty across the campus.
- Faculty participating in the program should be fully identified with the aims of the program. They should be carefully selected on the basis of exceptional teaching skills and the ability to provide intellectual leadership to able students.
- The program should occupy suitable quarters constituting an Honors center with such facilities as an Honors library, lounge, reading rooms, personal computers and other appropriate decor.
- The director or other administrative officer charged with administering the program should work in close collaboration with a committee or council of faculty members representing the colleges and/or departments served by the program.
- The program should have in place a committee of Honors students to serve as liaison with the Honors faculty committee or council who must keep them fully informed on the program and elicit their cooperation in evaluation and development. This student group should enjoy as much autonomy as possible conducting the business of the committee in representing the needs and concerns of all Honors students to the administration, and it should also be included in governance, serving on the advisory/policy committee as well as constituting the group that governs the student association.
- There should be provisions for special academic counseling of Honors students by uniquely qualified faculty and/or staff personnel.
- The Honors program, in distinguishing itself from the rest of the institution, serves as a kind of laboratory within which faculty can try things they have always wanted to try but for which they could find no suitable outlet. When such efforts are demonstrated to be successful, they may well become institutionalized thereby raising the general level of education within the college or university for all students. In this connection, the Honors curriculum should serve as a prototype for things that can work campus-wide in the future.
- The fully developed Honors program must be open to continuous and critical review and be prepared to change in order to maintain

its distinctive position of offering distinguished education to the best students in the institution.

- A fully developed program will emphasize the participatory nature of the Honors educational process by adopting such measures as offering opportunities for students to participate in regional and national conferences, Honors semesters, international programs, community service, and other types of experiential education.
- Fully developed two-year and four-year Honors programs will have articulation agreements by which Honors graduates from two-year colleges are accepted into four-year Honors programs when they meet previously agreed-upon requirements.
- A fully developed program will provide priority enrollment for honors students who are active in the program in recognition of their unique class scheduling needs. {March, 2004; November, 2007}

(Approved by the NCHC Executive Committee on March 4, 1994, and amended by the NCHC Board of Directors on November 23, 2007)

Part Two:

Understanding Talented Students and Teachers

One of the most common traits attributed to academically talented students is motivation. As we peruse the growing body of literature on teaching skills, instructor and course evaluation, outcomes assessment, learning styles, and student readiness for and transition to college, the issue of motivation moves increasingly to the forefront.

Larry Clark offers a thorough, research-based examination of the topic, focusing specifically on how motivation factors into the learning of high-ability students. Deconstructing the dense conversation in educational circles of what it means to be gifted or to be labeled an honors student, Clark studies the role of extrinsic versus intrinsic motivation, the extent to which motivation influences self-concept and identity development, and the usual characteristics associated with high-achieving learners, including being multi-talented, hyper-sensitive, and challenged in the area of peer relations. Furthermore, he takes a special look at women as an important subset within the group he defines as academically talented students and posits some ways in which we can recognize and support their particular gifts and learning styles. In closing, Clark reminds us, "As we continue to devise more effective means of teaching our best students, we must also continue to learn who those students are." The directive is wise counsel for all of us who teach our brightest students.

Clark's lengthy and extensively researched piece is balanced by **Marca Wolfensberger's** pithy, informal contribution on the qualities that distinguish successful teachers whose charge is to promote deep, differentiated learning among students in advanced, honors-level programs. Written from the vantage of having conducted numerous interviews and collected many evaluation results over three years in bur-

geoning honors programs in the Netherlands, Wolfensberger's essay on the "six habits of highly inspiring honours teachers," a Dutch take on the popular American series of books by Stephen Covey, outlines key features of good teaching in a casual, personal tone that makes her lessons accessible but no less practical and enlightening. Authenticity, courage, challenge, relationships, vision, innovation, and other attributes figure strongly in Wolfensberger's personal charges to the inspired teacher, and her piece is consequently uplifting, reminding us to do our best in order to receive the best from our students.

Still, it seems, no matter how much research we complete on the particular characteristics of high-ability students or their teachers, we continue to wonder just who these individuals are who interact in such special ways in the exciting atmosphere of the advanced, differentiated classroom. What if we could put these people in a single room and have them speak candidly about their experiences in honors-level teaching and learning? Would we learn more about them? Would we be able to craft our courses and programs better to match their expectations and talents? The "Teaching and Learning Fishbowl" is precisely the kind of event designed to answer such questions. A perennial favorite session at the annual conference of the National Collegiate Honors Council, the Fishbowl is organized to give students an honest, collaborative forum in which they can speak their minds while faculty and others simply listen and learn. **John Zubizarreta** offers a brief summary of a recent Fishbowl event, giving us an opportunity to ponder the value of honest student feedback in improving how we teach our academically talented students.

CHAPTER FIVE: MOTIVATIONAL ISSUES IN THE EDUCATION OF ACADEMICALLY TALENTED COLLEGE STUDENTS

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There are three things to remember about education. The first is motivation. The second one is motivation. The third one is motivation.
—Terrel Bell, former Secretary of Education
(Maehr & Meyer, 1997, p. 372)

Anne faces two challenges. Both will require a high level of skill, thorough preparation, total focus, and more than a little guts. One challenge she has been anticipating eagerly for several years. The other task she has been avoiding for the last several months. The latter task: finally doing the work for her senior honors project and getting it approved. The coveted former goal: going on a spring break trip and skiing the Rockies for the first time. That opportunity presented itself only recently when she came into a little extra cash (details are sketchy but involved two well-known universities and a ball) and found that there was one remaining seat in the van. Anne's nascent inner parent speaks to her. She pays the non-refundable trip fee to secure a spot for the trip after vowing not to go unless she has submitted a final draft of the senior project before the van leaves. As for the money, she figures: "Easy come, easy go." That is motivation.

Motivation at the human level is an exceedingly complex topic. Unlike the relatively simple drives and rewards/punishments that provide the push behind most behaviors in lower-order species, humans are moved by complex, interacting forces that can operate at abstract levels. In the 2002 edition of the *Annual Review of Psychology,* Eccles and Wigfield discuss twelve theories of motivation, grouped into four categories. In this chapter we will be able to consider only a few perspectives on motives. The focus here is on motivational issues relevant to the academic performance, broadly defined, of academically talented college students.

Giftedness and Motivation

As noted previously (Clark, 2000), the research literature on academically talented students is rather vast at the elementary school level, pretty extensive at the secondary level, and sparse at the post-secondary level. Consequently, to begin to understand the issues relevant to college honors students, we turn to the existing literature on gifted students in general. The current review will draw heavily from the pre-college gifted literature. Ages of subjects will be noted as needed to provide a developmental framework for the findings.

A second issue associated with the literature on gifted students involves the definition of giftedness itself. One of the common topics of discussion within the National Collegiate Honors Council (NCHC) is the diversity of honors programs. This diversity results from many factors, including the administrative structure of each institution and the student population each program serves. An important factor differentiating programs is the criteria they use to select students. Some programs use only academic criteria (grades, standardized test scores) for admission; some include more personal kinds of qualifications (essays on professional and personal goals). Some programs are highly selective; some have open admissions. Thus, what constitutes an honors student varies from campus to campus.

Similarly, *gifted* has been defined and assessed in many different ways (see, for example, *Conceptions of Giftedness* by Sternberg & Davidson, 1986). Giftedness has been differentiated by domain such as the "mathematically gifted" and the "artistically gifted." Giftedness has been differentiated by degree (one standard deviation above the mean vs. the top 1%). Most relevant to the current chapter, conceptions of giftedness have differed with regard to the role of motivation.

Many widely accepted conceptualizations of giftedness have emphasized the role of motivation in performance. For example, in his three-ring conception of giftedness, Renzulli (1986) sees *task commitment* as a central component of giftedness along with *above average ability* and *creativity*. Terman, in the mid-life follow-up of his landmark study of highly gifted children (Terman & Oden, 1959), noted that the most successful of his subjects could be distinguished from less successful subjects of equal ability by their *persistence in the accomplishment of ends* and *drive to achieve*.

President Calvin Coolidge recognized the importance of motivation for success in his famous observation on persistence:

> Nothing in the world can take the place of persistence. Talent will not: nothing is more common than unsuccessful men with talent. Genius will not; unrewarded genius is almost a proverb. Education will not; the world is full of educated failures. Persistence and determination alone are omnipotent. (qtd. in Fenchuk, 2000, p. 63)

A person of outstanding ability might be able to keep up with the average person without much effort. As the challenge rises, however, even gifted people need to increase their effort to be successful. Collegiate honors programs can serve as one type of motivation for superior academic work. One of the qualities that we like to celebrate about the graduates of our programs is their willingness to challenge themselves beyond the minimal requirements for a college degree. That is motivation, and we have all witnessed factors that can support or distract highly capable students in their effort to achieve academic excellence.

Motivation has been conceptualized in a variety of different ways even within the relatively narrow scope of gifted education. In a review of the literature on motivation and the gifted, Clinkenbeard (1996) classifies the research into eight categories, including "Studies that compare the scores of gifted students against the norms on a motivation measure" and "Studies that compare subgroups of the gifted on motivation type or style (for example, gender differences in gifted students' attributions)" (p. 220). Some theorists have treated extremely high motivation as being one type of giftedness in and of itself. For example, Gottfried, Cook, Gottfried, and Morris (2005) compare students with extremely high academic intrinsic motivation to their peers of average motivation from childhood into early adulthood. Motivationally gifted students show higher achievement, self-concept, and postsecondary educational progress. Gottfried, et al., also note, "Gifted motivation proved to be distinct from gifted intelligence" (p. 172; see also Gottfried & Gottfried, 2004).

The task at hand, then, is to gain some insight into motivational processes that affect academic performance of college honors students. Much of our information comes from studies and theories about gifted children and adolescence. The operational definitions of *gifted* and *honors*, as noted above, are both broad, and they share common features (standardized test scores, previous grades, teacher recommendations) so that they can be considered roughly equivalent designations for purposes of this discussion. Instances where extreme standards are used will be noted.

Extrapolating from findings on elementary and high school students to the college level raises some potentially interesting questions. Might processes such as surviving high school and being admitted to a college honors program serve as filters to screen out students with ability but limited academic motivation? Alternatively, might the variety and challenge of learning opportunities in college awaken an intellectual giant who had been dozing through earlier schooling? Might extracurricular factors that change from high school to college (e.g., being under the watchful eye of parents) affect students' work in our programs? Answers to such questions await the necessary expansion of the research literature on academically talented college students. Currently the pre-college literature provides a sense of the developmental trajectories that gifted students might follow.

This chapter considers four perspectives on motivation among the academic elite. The first involves students' orientation to academic tasks they face vs. the situation in which they face the task (intrinsic and extrinsic motivation). The second perspective focuses on students' developing sense of self, including their perceptions of their own superior intellectual abilities and their formation of an integrated identity. The third perspective involves personal qualities of gifted learners and how these characteristics aid or conflict with attainment of their academic goals. The fourth perspective involves special issues that affect academic performance among females, one subgroup of the academically gifted. Perhaps discussion of these selected topics will stimulate interest in extending research into the post-secondary population, as well as raise other questions relevant to the talented college students we teach.

Intrinsic and Extrinsic Motivation

One fundamental question addressed in the motivation literature involves where to place the source of motivation: within a task itself or in the circumstances in which the task is faced. A person who gets caught up in mastering and learning from the task itself is said to be *intrinsically* motivated. A person who takes on a task as a means to achieve outcomes external to the task itself, such as praise, a paycheck, or a grade, is said to be *extrinsically* motivated. A preponderance of the literature supports the tendency of academically talented students to be, on average, more intrinsically motivated than students in general.

For example, in a longitudinal study, Gottfried and Gottfried (1996) gave children the Children's Academic Intrinsic Motivation Inventory (CAIMI) at nine, ten, and thirteen years of age. (For more information

on CAIMI, see Gottman, 1986.) The CAIMI measures aspects of intrinsic motivation such as enjoyment of learning, curiosity, and persistence. It provides separate scores for reading, math, social studies, science, and school in general. Gottfried and Gottfried designated as *gifted* children who scored above 130 on the full scale W Intelligence Scale for Children—Revised (WISC-R) at age eight; the average IQ for this group was 137.8. The average IQ of the non-gifted group was 110.9. The gifted children were higher in intrinsic motivation across all subject areas and for school in general. After following the development of intrinsic motivation for verbal and math activities in children from nine to seventeen years of age, Gottfried, Fleming, and Gottfried (2001) concluded that intrinsic motivation in both domains becomes more stable over time, particularly during adolescence. Stability correlations reached .86 for intrinsic motivation for verbal activities and .63 for math activities by sixteen to seventeen years of age.

In the early 1970s, Deci (1971) raised questions about the impact of extrinsic reward on intrinsic motivation. Deci (1972a & b) and others offered evidence from a variety of circumstances using subjects from young children to adults that supported the idea that extrinsically administered rewards undermine intrinsic motivation. For example, Lepper and Greene (1975) found that an expected external reward and adult surveillance each reduced the amount of time preschool children spent engaged in a novel activity. Four- and five-year-olds were introduced to novel puzzle activities, shown in pretesting to be interesting for this age group, and given a chance to become familiar with them. They were then given a second set of similar but different puzzles. Researchers stressed to the children that on the second set of puzzles they were to work hard and solve the puzzles as quickly as they could. Two conditions were varied in this study. One condition involved the children's expectation of a reward contingent on their puzzle work. In the Expected Reward condition, children were told that the better they did solving the puzzles, the longer they would get to play with an attractive assortment of toys shown to them. In the Unexpected Reward condition, children were not told about the toys until after they had completed the puzzles. The second variable was surveillance. In the Surveillance conditions, children were told that a television camera in the room would allow the adult experimenter to watch them work on some of the puzzles. In the Non-surveillance condition, the camera was turned away from the child and nothing was said about being watched. Following these experimental treatments, the puzzles were made available in the children's classroom, and the amount of time they chose to

spend playing with the puzzles was recorded. Both expected reward and known adult surveillance decreased the amount of time spent playing with the puzzles by choice. That is, an expected extrinsic reward reduced intrinsic motivation to play with the puzzles.

Two decades of research into the dynamics among intrinsic motivation, extrinsic motivation, and a host of potential moderator variables have produced rather divergent conclusions. The title of Kohn's (1993) book—*Punished by Rewards: The Trouble with Gold Stars, Incentive Plans, A's, Praise, and Other Bribes*—emphatically conveys his perspective. In another context, Kohn (1994) states, "grades in particular have been found to have a detrimental effect on creative thinking, long-term retention, interest in learning, and preference for challenging tasks. . ." (p. 4). These words are sobering to those trying to foster the very qualities listed through honors programs that are largely grade-based.

Eisenberger and Cameron (1996) note that more than just trade books for the masses have sounded the alarm against extrinsic rewards. Articles in august professional journals such as the *American Psychologist* (Schwartz, 1990) and the *Journal of Personality and Social Psychology* (Condry, 1977) have drawn similar conclusions. Based on their own review of the literature, Eisenberger and Cameron (1996) reach a much different conclusion:

> Our analysis of a quarter century of accumulated research provides little evidence that reward reduces intrinsic task interest. . . . Moreover, there are two reliable positive effects of reward on intrinsic interest. With *verbal* [emphasis added] reward, people spend more time on a task following the reward's removal than before its introduction. In addition, people state that they like the task better after verbal reward or after tangible reward that depends on performance quality. (p. 1162)

Thirty years of research have also led Deci, now working with Ryan, to more nuanced interpretations of the intrinsic-extrinsic motivation relationship (Ryan & Deci, 2000; Deci, Koestner, & Ryan, 1999). Deci, Koestner, and Ryan (1999) conducted a meta-analysis of 128 studies that looked at the effects of extrinsic reward on intrinsic motivation. One variable that influenced the relationship in important ways is age. They found that *tangible rewards* have a more detrimental effect on intrinsic motivation for children than for college students. They also found that *verbal rewards* increase the tendency to persist at tasks for undergraduates, but not for children. Because these age effects had not been explored previously, Deci, et al., (1999) were left to speculate about their cause. Among several possible explanations, they suggest

that "college students have greater cognitive capacity for separating the informational ['you are achieving your goal'] and controlling ['do it this way'] aspects of rewards and are more accustomed to operating with performance-goal orientations, so they may be more ready to interpret rewards as indicators of their effective performance than as controllers of their behavior. . ." (p. 656).

In summation, intrinsic/extrinsic reward is one of the fundamental dimensions of motivation. Furthermore, questions about whether extrinsic rewards such as grades might undermine a personal desire to learn have reached the public domain, so students, faculty, administrators, and other interested parties might challenge the effectiveness of such extrinsically motivated programs. The research cited above can help explain the rest of the story. By the time they reach college, students can utilize feedback through grades in ways that younger learners cannot. Furthermore, the greater positive impact of *verbal* feedback at the college level offers support for the importance of small class sizes and mentoring opportunities to foster development of student potential.

Self-Concept and Identity Development

Academic environments often employ multiple indicators of success such as grades, promotion to the next level, and grouping of students by ability level. Thus, we are not surprised that research into the self-concepts of academically talented students shows them to be aware of their academic capabilities.

In addition to global or composite self-concept, the construct has been broken down into various components such as academic self-concept, physical self-concept, and social self-concept. Hoge and Renzulli (1993) did a meta-analysis of fifteen studies that compared the self-concepts of gifted children and adolescents to students not identified as gifted. The gifted students showed a small advantage in global/composite self-concept, but the big difference between the two groups was the higher ratings on *academic* self-concept by the gifted students. Essentially, no differences emerged between the groups on social self-concept and physical self-concept.

As noted above, the school environment provides redundant markers of academic success: the students in the Advanced Placement classes are also the ones graduating at the top of the class and the ones in the National Honors Society. Woo and Frank (2000) note that the credence given to some markers of achievement varies with academic success

itself. They had 208 college students complete a survey that included an academic self-esteem scale and a measure of the extent to which they believed that their grades reflected their academic ability. The results show that students with higher GPAs tend to see their grades as a more valid indicator of their academic ability than do students with lower GPAs. The findings are true regardless of the students' level of self-esteem. Thus, academically talented students in particular feel that their grades validate their ability.

One follow-up question to this self-awareness of their academic gifts involves determining how academically talented students think of those gifts: whether they consider their giftedness like a trait, rather fixed over time, or something changeable by factors such as effort. Kerr, Colangelo, and Gaeth (1988) studied 184 fifteen- to seventeen-year-olds who ranked in the upper 5% of their class and achieved scores at the 90th percentile or above on a standardized achievement test. They found that 64% of the gifted students viewed their ability "more in terms of performance" (p. 246) while 36% viewed it as a trait. Kerr, et al., concluded, "These results indicate that gifted students do not view giftedness or talent as a passive (inherent) quality but as a performance requiring effort and application" (p. 246). Later, we will see that effort has particular significance for the way that gifted females view their success.

Dweck (1975, 2000) has spent over a quarter century delineating a set of constructs that parallel trait vs. performance views of ability. She has called these an "entity theory" of intelligence and an "incremental theory" of intelligence. She describes each as follows:

> Some people believe that their intelligence is a fixed trait. They have a certain amount of it and that's that. We call this an "entity theory" of intelligence because intelligence is portrayed as an entity that dwells within us and that we can't change. . . .
>
> This view has many repercussions for students. It can make students worry about how much of this fixed intelligence they have, and it can make them interested first and foremost in looking and feeling like they have enough. They must look smart and, at all costs, not look dumb. . . .
>
> What makes students with an entity theory feel smart? Easy, low-effort successes, and outperforming other students. Effort, difficulty, setbacks, or higher-performing peers call their intelligence into question—even for those who have high confidence in their intelligence. . . .

> The entity theory, then, is a system that requires a diet of easy successes. Challenges are a threat to self-esteem. In fact, students with an entity theory will readily pass up valuable learning opportunities if these opportunities might reveal inadequacies or entail errors—and they readily disengage from tasks that pose obstacles, even if they were pursuing them successfully shortly before. . . .
>
> Other people have a very different definition of intelligence. For them, intelligence is not a fixed trait that they simply possess but something they can cultivate through learning. We call this an "incremental theory" of intelligence because intelligence is portrayed as something that can be increased through one's efforts. . . .
>
> This view, too, has many repercussions for students. It makes them want to learn. . . . And in fact students with this view will readily sacrifice opportunities to look smart in favor of opportunities to learn something new. . . . Even students with an incremental theory and *low* confidence in their intelligence thrive on challenge, throwing themselves wholeheartedly into difficult tasks—and sticking with them. . . .
>
> What makes students with an incremental view feel smart? Engaging fully with new tasks, exerting effort to master something, stretching their skills, and putting their knowledge to good use, for example to help other students learn. . . .
>
> These are the kinds of things—effort and learning—that make incremental students feel good about their intelligence. Easy tasks waste their time rather than raise their self-esteem. (2000, pp. 2–4)

Given those descriptions, if we could wish one of those perspectives on the students with whom we work, which perspective would we choose? Obviously many claims are packed into the definitions of entity and incremental theories, and a clear advantage is given to the incremental theory of intelligence. The interested reader is directed to Dweck's (2000) own tightly reasoned argument that she supports with numerous studies conducted by herself and others. Much of the research cited again involves elementary- and secondary-level students, but Dweck raises some important developmental issues regarding cognitive development and the changing nature of the school environment to stimulate interesting questions about the motives that drive superior college students.

Just focusing on the few studies cited by Dweck (2000) that involve college students raises some interesting issues. For example, Dweck refers to unpublished research by Elliott, Henderson-MacGyvers, and herself (n.d.) in which college students were asked to describe situations in which they feel *smart*. Students with entity theories of their intelligence often focus on performance goals. They say they feel smart "When I ace an exam" or "When the others are struggling, but it is easy for me" (Dweck, 2000, p. 42). In contrast, students with incremental theories of their intelligence usually say that they feel smart "When I'm working on something I don't understand yet" or "When I'm using what I know to teach someone else" (Dweck, 2000, p. 42).

Robins and Pals (1998), cited in Dweck (2000), found similar differences in the academic goals of college students who hold entity vs. incremental theories in a large-scale, unpublished study at the University of California at Berkeley. They also found that entity theorists often blame their failures on low ability, that they feel shame and embarrassment about their GPAs, and that they often give up in challenging situations. Conversely, incremental theorists report feeling determined or inspired by their GPAs and say that they usually persist in challenging situations.

Consistent with findings discussed previously, Mueller and Dweck (1997) found that college students who hold entity theories tend to see the role of effort in achievement differently than do students who hold incremental theories. Entity theorists agree more than incremental theorists with statements like the following:

> "If you're really good at something, you shouldn't have to work very hard to do well in that area."
>
> "I sometimes feel that the more effort you have to put into your school assignments, the less intelligent you probably are." (qtd. in Dweck, 2000, p. 40)

The inverse relationship that entity theorists see between effort and ability can put them in a bind when they are truly challenged. As Dweck (2000) notes:

> What does this mean for students confronting a difficult task? This is exactly when high effort is needed. Yet what a conflict this poses for students with an entity theory pursuing a performance goal and eager to show high ability. High effort may be necessary for success on the task, but high effort will automatically spell low ability. . . . It would be hard to maintain

> confidence in your ability if every time a task requires effort, your intelligence is called into question. (p. 41)

Feeling caught in this bind, the entity theorist may engage in such defensive behaviors as *self-handicapping*, the tendency to withhold effort, such as by procrastinating, when confronted with a challenging task. Dweck (2000) explains the reasoning behind this strategy as follows: "If you withhold effort and do poorly, you can still think highly of your ability, and you can preserve the belief that you *could* have done well had you applied yourself" (p. 41).

Although the previously described findings with college students are consistent with Dweck's entity/incremental model, all of the studies discussed (i.e., Elliott, Henderson-MacGyvers, & Dweck, [n.d.]; Robins & Pals, 1998; Mueller and Dweck, 1997) are listed by Dweck (2000) as unpublished; thus, addressing issues of sampling, procedure, and interpretation is difficult. In contrast, Dweck offers many studies she and others have published in support of her model at the elementary and secondary school levels.

Given their more negative response to challenges to their ability, would entity theorists fare more poorly than incremental theorists at some of the important transition points in schooling? Dweck and her colleagues focused on the transition to middle school because of significant changes occurring around that time in the performance standards to which students are held, the increasing emphasis on normative evaluations, and the decrease in individualized instruction. Henderson and Dweck (1990) compared entity theorists to incremental theorists across the 7th-grade year. They found that students with an entity theory tend to show a marked decline in grades despite the fact that many of them hold high confidence in their intellectual abilities at the beginning of that year. In contrast, incremental theorists tend to show improvement in grades over the year with many of the most impressive gains in grades coming from those students who have *low* confidence in their abilities at the beginning of the year. As Dweck (2000) notes, "Our findings thus show that students' level of confidence was not nearly as important as their theory of intelligence in helping them meet and conquer this difficult transition" (p. 31).

The step from high school to college can be every bit as daunting as that from primary to secondary school. Reasons for this include the greatly increased work demands and intellectual challenges that may be overwhelming, depending on the quality of pre-college preparation; the likelihood that the average ability in the academic peer group is much higher than in high school; and even less individual support and

guidance compared to their high school experience.[1] The first two of those conditions are likely to be accentuated in honors programs. In compensation, honors programs can address the third issue by being a strong source of support and guidance for students facing new academic and personal challenges.

The clear advantages of an incremental theory of intelligence raise the question of whether it can be instilled in students. Robins and Pals (1998) report a high degree of stability in theories of intelligence held by college students ($r = .64$ over three years) when no effort is made to manipulate them. Dweck (2000) cites several studies, however, in which personal theories of intelligence have been manipulated by experimental means. For his dissertation research, Bergen (1992) wrote two *Psychology Today*-style articles. Each article includes case studies and purported research results to support clearly either an entity or incremental theory of intelligence.

Hong, Chiu, Dweck, and Lin (1998) in another unpublished study presented college students with one of the two versions of Bergen's articles. They then gave the students a test of nonverbal ability. Students were told either that they had done relatively well on the test (better than 65% of the other students) or relatively poorly (worse than 65% of the other students). They were then given an opportunity to take a tutorial "that was found to be effective in improving performance on the test for most people" (qtd. in Dweck, 2000, p. 25). Most of the students who had been told that they had done fairly well on the test chose to take the tutorial (73.3% of those who had read the incremental theory article and 60.0% of the students who had read the entity theory article; not a significant group difference). So when entity theorists had their ability confirmed, they were not afraid to expose their ignorance by taking steps to enhance their performance further through participating in the tutorial. Quite different results occurred among the students who had been told that they did not perform well on the test. Most of the students who had read support for incremental theory wanted to take the tutorial (73.3%). Among those who had read about support for entity theory, only 13.3% wanted to try the tutorial. Ironically, then, among students exposed to a fixed view of intelligence, those most in need of remedial work were least likely to seek it presumably because they saw participation in that remedial work as a threat to their ability level.

Much of the research discussed thus far in support of Dweck's model includes subjects drawn from the general school population. Dweck (2000) believes that the model has special meaning for academically talented students:

> Our findings have implications for high-achieving students as well, especially for the labeling of children as talented or gifted. . . . [W]e may feel that we are giving children's self-esteem a boost by letting them know they are considered to be gifted. But even the term "gifted" conjures up an entity theory. It implies that some entity, a large amount of intelligence, has been magically bestowed upon students, making them special.
>
> Thus, when students are so labeled, some may become overconcerned with justifying that label, and less concerned with seeking challenges that enhance their skills. . . . They may also begin to react more poorly to setbacks, worrying that mistakes, confusions, or failures mean that they don't deserve the coveted label. If being gifted makes them special, then losing the label may mean to them that they are "ordinary" and somehow less worthy.
>
> Each Fall, without fail, hundreds of gifted students show up for college, all of them having been the stars of their high schools. What does it mean to them that a very large proportion of their classmates are equally gifted? For some it can be exhilarating to be in such a stimulating new environment with so many accomplished peers to interact with and learn from. But for others it is devastating to realize that their claim to fame—being smarter than everyone else—has disappeared. (p. 122)

Schommer (1990) provides some additional support for the significance of beliefs about the role of learning and effort on performance. She developed a system of four epistemological beliefs about the ability to learn, which range from being fixed at birth to being improvable. Schommer and Dunnell (1997) assessed the beliefs of 69 gifted (95^{th} percentile or higher on intelligence test or academic achievement) high school students. They found that the beliefs about learning held by these gifted students ranged widely. Next, the students had to respond to letters that were written in the style of "Dear Abby" letters. Students with strong beliefs about fixed ability to learn tended to write more simplistic responses to the letters. Furthermore, more of the students who had fulfilled their academic potential based on grades held beliefs that the ability to learn can be improved.

Thus, we see that the beliefs that a person holds regarding the modifiability of his or her intelligence can have wide-ranging effects on performance and self-perception. For those of us who try to stimulate talented students to develop their intellectual skills to the utmost, a

particularly troubling finding is that the very tasks we present to challenge students may induce students with a fixed entity theory of their ability to avoid the work if possible or "throw the game" if avoidance is not possible. Covington (1992) listed a variety of non-productive strategies that children develop to mask lack of ability, including procrastination, making excuses, avoiding challenging tasks, and not expending sufficient effort to succeed. The latter two strategies relate to Covington and Omelich's (1979) description of effort as a double-edged sword because it is necessary to accomplish difficult things, but effort that does not lead to success can be a threat to one's perception of one's ability. Eccles, Wigfield, and Schiefele (1998) note: "Avoiding challenging tasks . . . is often used by high-achieving students who are failure avoidant: Rather than being motivated by challenging tasks, such students try to avoid difficult tasks altogether to maintain both their own sense of competence, and others' perceptions of their competence" (p. 1024). The saving grace here is that if theories of intelligence are as readily modified as Dweck and her colleagues suggest, entity theorists can be converted to incremental theorists with proper instruction, thus reducing their reliance on non-productive reactions to challenge.

Angell provides some anecdotal reports that help to put a personal face on the general characteristics being discussed and show that such characteristics are not a new phenomenon. When he was director of the college honors program at the University of Michigan in the early 1960s, Angell collected autobiographical accounts from eighteen seniors of their experience in the honors program and college in general (qtd. in Robertson, 1966). As Robertson (1966) reports in Cohen's groundbreaking book *The Superior Student in American Higher Education*:

> These able students confessed that they felt uncertainty about their intellectual abilities early in their college careers. Very few of them considered high school achievement a very reliable indicator of excellence. . . . [A] young lady, in English honors, confessed: "In high school I had the highest grades by far of anyone in my small class of thirty. At the time I was pretty sure I was smarter than anyone else in the class. . . . Well, college soon corrected that notion. And incidentally it took only about three months for me to accept finally that [high school] grades and intelligence are more frequently unrelated than they are related." Even good grades in college did little to bring reassurance. A senior, reviewing her freshman experiences, wrote that she "studied all the time except when she was eating or sleeping." Although her diligence was well rewarded because

> she "had very good marks for both semesters, nevertheless, I continued to feel inferior both academically and socially."
>
> During their freshman year many felt the need for intensive study—for both reassurance and escape. They devoted long hours to their books and assignments chiefly because of self-doubt, fear of competition, or fear of faculty or parental disapproval. There was little evidence of delight in their courses, of love of ideas. . . . Some students hid the fact that they were studying excessively from their classmates in order to preserve the illusion of effortless brilliance. In a freshman honors mathematics course, for example, the students impressed each other by their evident ability to solve long and hard homework assignments easily and correctly. Later, from the safe vantage point of the sophomore year, the members of the class "confesed [sic] to each other that we had spent most of the weekends solving these problems but thought that the 'others' in the class had no difficulty with them." (pp. 56–57)

In addition to questions about the modifiability of their intelligence, students have also been asked about the advantages and disadvantages of having high ability. In the Kerr, et al. (1988), study of gifted adolescents cited previously, the students were asked to respond to open-ended statements such as the following to assess their views on the advantages of being gifted: "The best thing about being gifted . . ." and "I was happiest about being gifted when. . . ." Their responses were classified into one of three categories: *personal*—"giftedness as an opportunity for personal growth, greater self-confidence or inner harmony"; *academic*—"focusing on ease with course work, opportunities for advanced classes, getting high grades, problem solving abilities, and opportunities for scholarships"; *social*—"focusing on social recognition, peer relations, and contributions to society" (p. 246). Thirty-three percent of the adolescents felt that the best thing about being gifted was personal; 37% gave academic responses; and 29% responded with social reasons. The students were also asked to list disadvantages of being gifted by responding to the following items: "The worst thing about being gifted . . ." and "I was unhappiest about being gifted when. . ." (p. 246). Five percent of the adolescents wrote that the worst thing about being gifted was personal; another 5% gave a response in the academic category; and a whopping 90% gave social disadvantages. Another finding echoed this view of the negative reflection of giftedness in the social environment. Kerr, et al. (1988), summarized the

attitude toward giftedness by each student across all of their responses in the study: "Regarding the overall effect of giftedness on *self*, 79% viewed it as positive, 2% as negative, and 19% as neutral. Regarding the overall effect of their giftedness on *others*, 5% viewed it as positive, 43% as negative, and 52% as neutral. Evidence from these results suggests that giftedness is a positive quality in one's own life but that the perceived impact on others is negative or ambiguous" (p. 246).

Coleman (1985; Cross & Coleman, 1993; Cross, Coleman & Terharr-Yonkers, 1991) pulls together some of the more negative social effects of being identified as gifted in his Stigma of Giftedness Paradigm (SGP). The paradigm states that "1) gifted and talented students want to have normal social interactions, 2) they believe that people treat them differently when aware of their giftedness, and 3) they can influence how others interact with them by manipulating the information others have about them through various coping strategies" (Cross & Coleman, 1993, p. 37). Cross and Coleman (1993) tested the paradigm with a questionnaire administered to 1,465 high school students who attended the Tennessee Governor's School (TGS) Program in 1986 or 1987. The TGS is a four-week residential program held on five university campuses across the state of Tennessee. The typical student in the TGS program was in the top 5% of his or her high school class with a GPA above 3.75. While they reported slight behavioral differences from the other students in their high schools, overall these gifted adolescents did not feel different socially from the typical student. In contrast, 77% saw themselves as intellectually different from the typical student. When asked how they thought that they were seen by other students in general, teachers, and their friends, they replied that they feel that all three groups see them as different and that teachers make the greatest distinction between them and typical students. The researchers also found the following:

> Over half the subjects noted engaging in coping behavior (e.g., foregoing comments and hiding differences) which controlled the information available to others. This reflects the third tenet of the SGP: gifted students can influence how others interact with them by manipulating the information others have about them through various coping strategies. More than half indicated that they do not often feel free to be themselves in their high schools. . . .
>
> Why would these gifted students engage in coping strategies unless they assumed that being themselves would potentially

> stigmatize them? The researchers reason that the use of coping strategies implies that gifted adolescents desire to maintain normal social interactions (SGP tenet one), which is a direct reflection of tenet two of the SGP—gifted students believe that people treat them differently when aware of their giftedness. (p. 39)

Plucker and Levy (2001) also take a broad view of the potential disadvantages of high ability. In January 2000, the *American Psychologist* published a special issue on positive psychology. In that issue, Winner (2000) and Lubinski and Benbow (2000) provide evidence that gifted individuals fare well in general. In a rejoinder to those views, Plucker and Levy's (2001) "The Downside of Being Talented" cites evidence of intrapersonal challenges such as perfectionism, fear of failure, feelings of isolation, and interpersonal challenges such as Coleman's Stigma of Giftedness Paradigm and professional jealousy as sources of discontent among the talented.

To this point in our discussion of the relationship between self-concept and giftedness, we have looked at whether people of high academic ability recognize their relative level of ability, how modifiable they think their talents are, and what valence they attach to their ability. Is it a prize, a curse, or both? Erikson's description of the process of developing an identity helps to raise the issue of self-concept to a higher level of conceptualization.

Erikson (1950) describes a series of eight *psychosocial stages* that people progress through across the lifespan. Each stage represents a new challenge between the developing individual and his or her expanding social world. Each challenge must be adequately addressed for the individual to progress to the challenge of the next stage. For example, Erikson describes the challenge of the first stage, roughly the first year of life, as developing a sense of *basic trust* in one's social world. If the infant is treated in ways that result in a sense of security and satisfaction, the infant will develop basic trust and will seek more social interaction in the future. If, however, the infant feels insecure and experiences want and pain from the social world, *mistrust* will develop and the child may pull away from the social world.

Erikson (1950) saw development of an identity as the primary psychosocial task of adolescence, and he defined identity as "the accrued confidence [in] the inner sameness and continuity of one's meaning for others" (p. 235). Patterson, Sochting, and Marcia (1992) describe three necessary elements of a developed identity:

> First, the person must experience inner sameness, or integrity, so that actions and decisions are not random. Defined values, principles, and expectations order one's behavior, and a deviation is perceived as "not me." Second, the sense of inner sameness is continuous over time. Actions in the past and hopes for the future are experienced as related to the self of today. Third, identity is experienced within a community of important others. Relationships and roles serve, ideally, to support and validate an integrated, continuous identity. (p. 9)

Marcia (1966, 1980) elaborates Erikson's concept of identity achievement into his Ego Identity Status model. In his model, Marcia delineates four ego identity statuses that vary in exploration and commitment. *Exploration* involves actively searching for an integrated identity. In this search, the adolescent may try out various behaviors and social roles to see how they "fit." This can be seen in the effort most adolescents exert to try to fit in with various cliques in the school or other settings. *Commitment* refers to the individual's identification of his or her own "true self." The identity formed in late adolescence, then, will lay the foundation for decisions about adult roles such as career and relationship choices. The four ego identity statuses described by Marcia are the following:

1. *Identity diffusion.* This is the least developmentally advanced status. The person has not yet achieved commitment in the search for identity, and exploration for that identity may not have begun in earnest yet or may have been superficial.
2. *Moratorium.* This status involves the active exploration for an identity. Commitments have not been made yet, but the person is intensely involved in exploring identity options.
3. *Identity achievement.* This is the more developmentally advanced resolution of the search for an identity. The individual has actively explored the identity options and has committed to an integrated sense of self.
4. *Foreclosure.* In this status, the individual has committed to an identity but has not engaged in a rigorous search for that identity. This resolution of the identity search is not as stable as identity achievement. Future challenges to identity—arising from future role shifts such as starting a career, getting married, or becoming a parent—are more likely to threaten someone in the foreclosure status than someone in the identity achievement status, since the latter has found his or her own identity rather than accepted an identity given to him or her.

Who might end up in foreclosure status? One group of interest is the intellectual elite. From the time young children's intellectual gifts are discovered, maybe as early as preschool screening, they may be encouraged to think of careers in medicine, law, engineering, and the like. By the time they reach adolescence, their future identity, at least the career part of it, may be a foregone conclusion. Until they hit college. Then all kinds of questions can arise. Can I survive medical school? How does the type of law or business I might practice square with the way I view myself? Why was I never exposed to classical guitar before? Many changes in major occur among the most able students not due to a lack of ability but to the discovery or maturation of a new passion or disillusionment in an old goal.

Marcia (1966, 1980) and others have broken down global identity into a number of components such as occupational identity, interpersonal identity, political identity, and religious identity. Identity development is not necessarily consistent across domains, and foreclosure is possible in each area. For example, students coming from very small towns where everyone has attended the same church might experience theological culture shock when they hit campus and are exposed to radically different world views. Some very bright students have their educational, social, and personal development disrupted by powerful internal struggles as they reconcile the world view that they were taught as a child with the intriguing or scary new ideas to which they are being exposed in college. In cases like these, greater mental ability may accentuate the conflict by making students better able to appreciate such abstract and complex issues.

Buescher has served as a counselor and teacher of gifted students for many years. At one time, he was a therapist and Research Scholar at the Center for Talent Development at Northwestern University, where he also taught courses in gifted education. Buescher (1991) writes:

> Identity foreclosure poses perhaps the most serious challenge for talented adolescents en route to maturity. They seem more disposed than most adolescents, perhaps because of their early identifications with trusted adults, to move quickly to foreclose any risky, unwanted exploration of identity issues. Heeding the freely given recommendations of teachers, counselors, parents, and most importantly, *themselves*, bright adolescents latch on quickly to any semblance of identity, no matter how unsuitable or mismatched to skills, discipline, or talent areas.

> While this tendency is not unique to talented students, they appear more likely to maintain the foreclosed identity in the face of mounting troubles. Elkind (1984) warned parents and teachers about the tendency adolescents have to adopt "patchwork selves" or identities as a way to cope with society's increased pressure to grow up and act independent quickly, thereby freeing adults from their caretaker and parenting roles. Apparently, the pressure of competing expectations from adults and the lack of patience felt by talented adolescents fuels their rapid search for a secure identity, convincing them to settle for an unexplored yet foreclosed point of development. (p. 390)

Drawing from his extensive educational and clinical experience, Buescher paints a rather dire picture of the talented student mired in the foreclosed identity status. Is there empirical evidence to support his case? Unfortunately, according to Wigfield and Wagner (2005), "There is a dearth of research connecting Erikson's and Marcia's identity theories with academic outcome variables, and much is unknown about the academic implications of different identity statuses" (p. 229). That sounds like a research opportunity waiting to happen.

As educators, what is our role in helping our students consolidate their identities and find their own path? No simple answer exists; however, our first effort should be directed toward helping students learn what paths will be most satisfying in their own lives in relationship to their other desires, involvements, and commitments. Perhaps faculty can develop self-exploratory projects in their courses, particularly in the transitional freshman year. For example, some writing projects in an English class could be autobiographical. A history class could ask students to envision the future they will live in based on historical trends and how they will impact their careers and family lives. A psychology class could address the adolescent-adult transition by requiring a self-analysis by students of their own current developmental status. Such self-reflection might also be stimulated by extracurricular activities within an honors program or by reflective learning portfolio strategies.[2]

We also must make our best students aware of some of the ways that their special capabilities can affect their accomplishments in school and in life. The next section addresses a few of the special qualities that have been identified in gifted people that can influence how they navigate the tricky currents of life.

Some Special Characteristics Associated with High Ability

Numerous qualities have been identified as characteristic of gifted people. As with most group descriptions, researchers disagree about the degree of distinction between gifted and non-gifted people for many of the characteristics. We must also remember that within both gifted and non-gifted groups, a wide range of individual variation for all of these characteristics exists. Although a wide variety of distinguishing characteristics has been discussed in the gifted literature, only a few examples can be explored here. These are being multi-talented, being hypersensitive, and having special challenges with peer relations.

Many researchers since the time of Terman (1925) have reported that people who are highly talented in one area tend also to be talented in other areas; that is, they are multi-talented. More recently, Csikszentmihalyi, Rathunde, and Whalen (1993) began a creative and interesting in-depth study of the ongoing experiences and feelings of talented teenagers by identifying adolescents who were talented in mathematics, science, art, athletics, and/or music. They described their selection process as follows: "In each talent area we first restricted the selection pool to 9th and 10th graders in accelerated or advanced classes. From this group, the teachers nominated subgroups of students who they felt possessed the potential to pursue talent development to superior levels of proficiency in their fields" (p. 43). The method yielded 394 students. Of that total, 309 students (78%) were judged to be of superior ability in one area and 85 (22%) were identified as being extremely talented in two or more areas. This result will not shock people who have seen the pre-college résumés of academically talented students; some of the valedictorians and salutatorians were also star varsity athletes, outstanding performers, or student leaders at the school, state, or even national level.

As with giftedness itself, people who are unaware of the psychological dynamics of high ability might think: "Being multi-talented. What's not to like about that?" In general, nothing. Being excused from a class in quantum mechanics after setting the curve on the first three exams to compete in a national music competition has its obvious rewards. But as noted previously, with talent comes challenge, and multiple talents can render multiple challenges. One such challenge can be making a choice. A few years ago, I conducted several workshops at regional and national honors conferences (e.g., Clark & Bergner, 2003) on this issue. The titles of the workshops were variations of "multiply-talented,

multiply-interested, multiply-confused." Many students and faculty who participated in those workshops nodded in agreement as we discussed the anguished conflict faced by someone forced to pick a major and a career path between being a brain researcher or an oboist in a symphony orchestra. Some schools have created individually designed majors that enable multiply-talented and multiply-interested students to create their own interdisciplinary degree programs. One of my favorite examples was a very bright and creative young man who crafted together a major in physics, philosophy, and dance. At one time, he had a language as a fourth component, but he had to drop it because of all of his involvement in theatrical productions and his goal personally to know every single one of the 10,000 students on his campus (really).

Many people who have worked with gifted students report that they are especially sensitive or reactive in a variety of ways. Emotionality and counseling are very common topics in major overviews of giftedness (e.g., Colangelo & Davis, 1997; Heller, Monks, & Passow, 1993) as well as the focus of publications such as Kerr's (1991) *A Handbook for Counseling the Gifted and Talented*. One of the more comprehensive views on heightened emotionality among the gifted was developed by Dabrowski. Since the early 1970's, Piechowski has collaborated with Dabrowski and promoted his model of emotional development. Dabrowski (1967, 1972) has studied the mental health of intellectually and artistically gifted youths. He has found many in this group to exhibit a high level of emotional intensity. Dabrowski sees this as a positive potential for further growth rather than a symptom of developing neurosis; thus, he calls it *developmental potential*. He says that developmental potential includes talents, special abilities, and intelligence, plus five primary components: psychomotor, sensual, intellectual, imaginational, and emotional. Piechowski (1991) says, "These five dimensions to a varying degree give talent its power. . . . They may be thought of as modes of experiencing or as channels of information flow that can be wide open, narrow, or barely present" (p. 287). Dabrowski calls these five dimensions forms of *psychic overexcitability*. They contribute to psychological development so their strength is an indicator of an individual's developmental potential.

Piechowski (1991) notes: "Strong developmental potential and giftedness go together" (p. 299). The *intellectual* component of developmental potential is probably most evident to those who work with academically successful students. It includes curiosity, capacity for sustained intellectual effort, extensive reading, and introspection, among other characteristics. While each of the forms of overexcitability is

motivational in nature, the *emotional* component is particularly relevant to the current discussion. It includes qualities such as extremes of feeling, concern for others (empathy), conflict with others, and self-judgment. Piechowski (1991) observes: "The outstanding feature of the emotional development of the gifted is their emotional sensitivity and intensity. Sometimes it is hidden; sometimes it is prominent" (p. 303). Further, he notes, "What is distinctive in the gifted is an acceleration of development and a greater intensity of existential questioning" (p. 303). Others have reported on the heightened emotionality of gifted people. Clark (1983) says that a strong sense of justice and idealism appears early in gifted children. Silverman (1983) observes emotionally sensitive behaviors in gifted children as young as two-and-a-half years.

A recurrent theme of this chapter, emotional overexcitability, which is described by Dabrowski and Piechowski, can have both helpful and complicating effects. On the positive side, we might ask if the empathic quality of emotional overexcitability helps to explain the number of sessions on honors service activities that appear on the programs of the regional and national honors conferences.

Miller (1981) offers a contrasting take on the development of emotionally gifted children. She notes that they are well attuned to their parents' desires and many of them want to please their parents. In that quest, they may lose some insight into themselves, accepting the parents' view of their future rather than seeking their own. In a scenario akin to the previous discussion of Marcia's foreclosure identity status, gifted students might then find the particularly open and self-reflective atmosphere of college to be the spark that challenges some of the definitions of self they previously accepted from parents, teachers, and others.

In addition to the challenges of being multiply-talented and overexcitable, intellectually talented people can also face some special issues in their relations with people of average mental ability. One factor to be considered is the very overexcitabilities just discussed. As Piechowski (1991) himself notes: "The stronger these overexcitabilities are, the less welcome they are among peers and teachers (unless they, too, are gifted)" (p. 287).

A variety of potential conflicts with peers in childhood can result from the generally asynchronous development represented by the intellectually superior child. In terms of physical age and perhaps emotional age, gifted children may be the equal of their chronological peers, but in terms of mental capability, they are operating on a different level. Gifted children may structure play activities at a level beyond

the appreciation of children of more average mental ability; they might press more sophisticated value issues (e.g., justice) than many average-age peers can follow; they might promote interests such as reading or in-depth investigation that hold little interest for average-age peers; they may use vocabulary and concepts that are foreign to their chronological mates.

Despite the many ways that an intellectual disparity might negatively influence peer relations, the majority consensus in the existing literature hearteningly indicates that many intellectually superior students not only do not suffer from social ineptitude but in fact in some ways are superior in that realm, too. Again, when we think of the officers of student organizations, captains of sports teams, and other influential students who participate in our honors programs, that finding makes sense. Intellectual skills can be applied to understand or effectively persuade peers; they can be used to solve problems or organize activities that benefit age-mates. In his seminal studies, Terman (1925) found that teachers rate their gifted students similarly to their non-gifted students in popularity and rate the gifted students higher in leadership. Interestingly, in the same study, Terman reports that gifted children six to thirteen years of age "show measurably greater interest than the [average child] in activities that require thinking and that are mildly social and quiet" (p. 437). Perhaps some gifted children learn to accommodate their own intellectual interests by engaging in individual activities or interaction with small groups of others with similar interests. Terman also reports that compared to average students gifted students have more than twice the tendency to associate with children older than themselves. Terman attributes this association "in part to a tendency for mental ages to seek their level" (p. 431). That is, gifted children seek out their intellectual peers, not their chronological peers.

Decades after Terman's study, Schneider (1987) provides a much more emphatically positive view of the social status of gifted children. Schneider reviewed thirteen studies conducted from the mid-1950s to the mid-1980s in which the sociometric status of gifted and non-gifted children was compared. His conclusion: "Every sociometric study of the peer relations of the gifted child at the elementary school level indicates that they are better accepted than controls!" (p. 29). Little difference between the two groups was seen beyond the elementary school level.

This chapter began with a discussion of the vagaries and varieties of definitions of *gifted* and *honors student*. The former term has been applied to individuals with IQs ranging from about 125 up past 200, where the validity of most current intelligence tests is suspect. That is

quite a range. Would we not expect the person with an IQ of 200 to be at least as different intellectually from a person with an IQ of 130 as the 130 IQ would be from someone with below average intelligence? Whatever tensions might arise in the interaction between people of different intellectual capability might also be expected to increase with the disparity in mental age. Hollingworth (1931, 1942), working in the same era as Terman but with much less initial recognition, provided some evidence on that point. Hollingworth and Terman conducted some of the earliest in-depth research on highly gifted people. Hollingworth began with six young children who had an IQ above 180. Of that group Hollingworth (1942) reported that only one child "had no conspicuous difficulty in play, during early childhood" (p. 274). Furthermore, Hollingworth noted that the exceptional child "attended a private school where a number of the pupils tested above 140 IQ" (p. 274). This study provides one of the arguments used in favor of special educational opportunities for the gifted; not only will they be more effectively challenged by a curriculum that is commensurate with their abilities, but they are also more likely to find intellectual peers.

After their review of the research on the psychosocial development of intellectually gifted children, Janos and Robinson (1985) concluded: "Findings regarding favorable personal and social adjustment emanate from studies of moderately rather than extremely gifted children. The most highly talented are the most vulnerable, probably because they are exceedingly 'out of sync' with school, friends, and even family" (p. 182).

Subgroups of the Gifted: Issues Regarding Highly Talented Women

To keep order and maintain efficiency in dealing with a complex world, our brains classify objects and experiences on the basis of perceived similarities. In our social world, this propensity can lead to stereotyping people according to the group into which we categorize them. Those working with highly talented students must sometimes address the stereotyping of that group when recruiting students to honors programs, when helping faculty to develop as effective teachers of those students, and when explaining to administrators and others the holistic needs of these students. Whatever the word *nerd* (or fill in the current vernacular) means, it does not seem to fit most of the academically successful, creative, multitalented, and socially skilled students who have been described in this chapter and who populate honors programs.

As noted in the introduction to this chapter, *giftedness* has been differentiated by such factors as domain of special talent (the mathematically gifted) and by degree of superiority (students with IQ's above 180). Gifted students have also been distinguished by level of achievement (underachieving gifted) or skill level (learning disabled gifted), and by demographic characteristics (minority gifted). While all of these groups warrant special consideration, within the confines of this chapter, one subgroup of academically talented students will be addressed: females.

When we compare groups such as females and males, we should remind ourselves prudently that such groups may exhibit statistically significant differences despite tremendous overlap between the groups. Or put another way, within-group differences typically are much greater than between-group differences. Or put more personally, "I don't fit this profile of my gender." We are talking here about general gender *group* differences on specified characteristics.

One area of interest regarding gifted females is the types of attributions they make for their success or failure in various domains. Females of high academic achievement attribute their success more to effort rather than ability and report actually expending more time on school work than do accomplished males. For example, Hong and Aqui (2004) found that female high school students who were academically talented in math reported exerting more effort than did their male counterparts. Subotnik (1988) reported similar findings for females in a science talent search of high school seniors, as did Kramer (1991) in her in-depth ethnographic study of ten gifted females in a middle school.

Such gender differences in attribution continue into the college years. Perrone and Dow (1993) followed over 1000 students who graduated in the upper 2% of their high school class into college. After their second year in college, more females than males (77% vs. 60%) attributed their academic success to hard work. These self-attributions are consistent with self-reported actual behavior. Among 325 incoming freshman honors students at a large mid-eastern university, Noldon and Sedlacek (1998) found that the men reported studying an average of 1–3 hours per week while the women reported studying an average of 4–5 hours per week. The extra effort by talented females does not go unnoticed. In one study, teachers of gifted 4th through 8th graders consistently rated female students higher in effort although they rated males and females equally capable in all areas except language arts, where they rated females as having higher ability (Siegle & Reis, 1998).

As noted earlier in this chapter, effort can be a two-edged sword. While the extra academic effort reported by gifted females probably contributes significantly to their overall superior academic performance relative to males throughout their schooling, it can also undermine their sense of their own capabilities. Bandura (1977) notes in discussing his theory of *self-efficacy* that success with minimal effort fosters ability ascriptions that reinforce a strong sense of self-efficacy (as with gifted males). By contrast, analogous successes achieved through high expenditure of effort connote a lesser ability and are thus likely to have a weaker effect on perceived self-efficacy (as with gifted females) (p. 201).

Steele (1997) identifies another attributional trap he calls *stereotype threat* into which talented females can fall in specific domains. Stereotype threat is one possible explanation for the decreasing involvement of females in math-related areas through their school years. If a female, despite her initial interest in and actual aptitude for math, buys into the stereotype that math is hard for girls, she might avoid threat to her self-concept by opting out of math domains, not taking any more math courses. Being in an academically rarified environment such as a gifted class or an honors program might exacerbate this effect because some gender differences in performance are accentuated at the extreme levels. For example, Benbow and Minor (1986) reported that the male-to-female ratio on the Scholastic Aptitude Test for Mathematics is 2 to 1 at the average level, 4 to 1 for the top 15%, and 132 to 1 for the top 2%.

Fortunately, the attributional hurdles for females described here appear to be modifiable by some fairly straightforward methods. Steele (1997) himself suggests some approaches to addressing stereotype threat as do Johns, Schmader, and Martens (2005). Ziegler and Heller (2000) describe a successful approach to attributional retraining for 8th-grade German girls in their first physics class and for high school girls in mathematics and college women in statistics (Heller & Ziegler, 1996).

In addition to the gender difference in ability-effort attributions, another focus of research on gifted females is the general decline, which begins around puberty and continues into the college years, in facets of self-concept. In a cross-sectional study, Klein and Zehms (1996) found that total self-concept declines significantly for both gifted and non-gifted girls between the 3rd and 8th grades, but that the self-concept of gifted girls also declines significantly between the 5th and 8th grades, while it does not for non-gifted girls. In another cross-sectional study, Kline and Short (1991a) found that gifted girls in grades 9–12 have significantly less self-confidence, more perfectionism, and more

discouragement than gifted girls in grades 1–4. The 9th–12th graders also have significantly more discouragement than do gifted 5th–8th grade girls. In contrast, gifted boys (Kline & Short, 1991b) have more discouragement in junior high school than high school.

The decline in self-concept of gifted females continues into the college years. The Illinois Valedictorian Project followed the top high school graduates in that state in 1981 as they progressed through college and beyond. From that study, Arnold (1995) concludes: "Women—but not men—showed a sharp decline in their self-estimated intelligence between high school and their sophomore year of college" (p. 105).

The post-pubertal decline in self-concept among gifted females apparently is not entirely the result of gender socialization in the United States. Lea-Wood and Clunies-Ross (1995) compared the total self-esteem and social self-esteem of gifted and non-gifted adolescent girls in Australia. They report negligible difference between the groups at year seven, but significantly higher total and social self-esteem among the non-gifted girls at years eight and nine.

In addition to some components of self-concept declining in gifted girls through adolescence, gifted girls' feelings about their own superior talents are also less positive than the same feelings among their male counterparts. The Kerr, et al. (1988), study of gifted adolescents' attitudes toward their giftedness, discussed previously, found that while bright females showed a trend ($p<.09$) toward perceiving more social advantages to their giftedness than males, they showed significantly more focus on the negative social aspects of being gifted. Similar concerns among females about the social effects of being identified as gifted have been found by Bell (1989) and Renold (2001), among others.

A somewhat different take on the self-concept of gifted girls comes from the work of Hollinger and Fleming (Hollinger, 1983, 1985; Hollinger & Fleming, 1984, 1988). Kerr (1997), who has spent much of her own career researching, counseling, and teaching about gifted students, calls Hollinger and Fleming's program of study "[p]erhaps the most significant work in the area of the adjustment of gifted adolescent girls . . ." (p. 488).

Hollinger and Fleming believe that social self-esteem is crucial to the fulfillment of potential by gifted girls. They conceive of social self-esteem as comprised of two elements they call instrumentality and expressiveness. *Instrumentality* refers to the belief that one makes decisions independently and acts effectively. *Expressiveness* refers to the degree to which one is caring and responsive to others. Hollinger and Fleming believe that instrumentality has the greatest overall impact on

self-esteem. In support of that idea, they present data (Hollinger & Fleming, 1988) on gifted females they tracked from their sophomore year of high school to three-and-a-half years after graduation. They found that self-perceptions of instrumentality predicted *occupational confidence* and *life satisfaction.* In contrast, expressiveness did not predict occupational confidence or life satisfaction, but it did predict *social self-esteem* (in combination with instrumentality). Based on these findings, Kerr (1991) concludes that "gifted girls need to be encouraged to develop not only those instrumental characteristics associated with masculinity but also the expressive characteristics associated with femininity if they are to be highly achieving as well as socially confident. Gifted girls need to understand that they do not need to reject the nurturing, caring side of themselves in order to be bold and achieving" (p. 489). "Expressiveness," Kerr believes, "is more likely to be gifted girls' strong suit" (p. 493), but instrumentality can be increased through leadership opportunities, development of decision-making skills, encouragement to take risks, and rewarding of "boisterousness and idiosyncrasies" (p. 493) rather than compliance in gifted girls. She also believes, "Social self-esteem seems to protect gifted girls from fears of social rejection that may accompany high achievement and serves to build the self-confidence needed to follow through on high goals" (p. 407).

The significance of expressiveness for gifted girls (and, indeed, for females in general) raises the question of the relative roles of task- versus people-orientation in the decisions that they make about how they will invest their talents and energies. Research suggests that for many gifted females the task often involves people. For example, Noldon and Sedlacek (1998) found that more gifted female freshmen (81%) than male freshmen (53%) expected to do community service in college. Perhaps as gifted girls have their female identity reemphasized by their pass through puberty followed by the focus on future career/family/life goals in college, many eventually commit their abilities and efforts to endeavors, professional and personal, that involve connections to other people.

Variations on this task/person orientation perspective have been used to explain why females, despite their significant educational advances in recent generations, still trail males at the upper levels of achievement in areas like math, computer science, and engineering. For example, while the National Science Foundation reported that there had been significant increases in the number of doctoral degrees awarded to women in the United States in all areas of science since the late 1960s, still in 2003 women accounted for only 27% of the Ph.D.'s

in the physical sciences, 24% in math and computer science, and only 17% in engineering (Hand, 2005).

To make sense of such figures, we first must recognize that many females are still actively dissuaded from striving to excel in subjects such as math and science. Danica McKellar provided some anecdotal evidence of this in testimony she gave before the House Committee on Science (McKellar, 2000). She was responding to a commission report on methods to attract more women and minorities into science, engineering, and technology. McKellar was best known at that time as the actress who portrayed the character of Winnie Cooper in the very popular television series *The Wonder Years.* In her self-introduction to the subcommittee, she said, "I graduated Summa Cum Laude with a math degree from UCLA with highest departmental honors, blah, blah, blah" (2000, n.p.) While she described great support for her success in math by her college faculty, she noted that her academic skills often shock her adoring fans:

> I have had my share of run-ins with not fitting the "stereotype" of a scientifically-minded young woman. Every day, people approach me, and recognize me for my portrayal of the character "Winnie Cooper" on the television series *The Wonder Years.* And every day people ask me what I am doing now. When I tell them I took a break from acting in order to attend college, they inevitably ask what my major was. When I tell them "math" . . . Mouths drop open . . . mixed with stares of horror and confusion . . . usually followed by a looks [sic] of intrigue and newfound respect, but always the incredulous, "Why. . . ?" They were not expecting that to come from me, since I do not fit among the ever popular stereotypical images of math nerds. (At least that's what I like to think.) (2000, n.p.)

Unfortunately the television public was not the only group to "not get" McKellar's passion for math. Potentially important role models and supporters were also perplexed:

> [In 9th grade] After our first test, my science teacher pulled me aside and expressed surprise at my high score, exclaiming how unexpected it was that I would be a good student in science. "You just seem so outgoing and you wear such brightly colored earrings. . . . I just didn't think you would be very smart." All based on appearances, the teacher was judging me according to the stereotypes that are so deeply ingrained in our society: the socially inept, nerdy looking guy who doesn't care about fashion. Here's the most interesting part. *The teacher was a woman.* (2000, n.p.)

One of McKellar's proudest achievements while at UCLA was coauthoring the Chayes-McKellar-Winn theorem with a professor and a fellow (female) math major. *The Journal of Physics* (Chayes, McKellar, & Winn, 1998) published an article on the theorem titled "Percolation and Gibbs States Multiplicity for Ferromagnetic Ashkin-Teller Models on Z^2."

McKellar feels so strongly about the need to counteract the stereotypes about girls who like and/or are talented in math that she has written a book titled *Math Doesn't Suck: How to Survive Middle-School Math Without Losing Your Mind or Breaking a Nail* (2007). The subtitle conveys her teen-girl-friendly approach to the subject matter. The volume "uses cutesy graphics and teen-magazine staples like personality quizzes, horoscopes and straight-from-the-mall examples to spell out often confusing concepts like reciprocal fractions and prime factorization" (Tyre, 2007, p. 43). An example: "Say you have $50, and you want to buy a fabulous blue sundress that costs $62. Bummer! Not enough money. But wait, there's a sale tag that says it's 1/5 off. Do you have enough money now?" (qtd. in Tyre, 2007, p. 43).

We can return to the task vs. people motivational distinction between the genders using Eccles's (1994) model of achievement-related choices. Eccles has spent more than twenty years investigating factors that influence motivation to excel. She has focused on the expectancy-value distinction in motives that others have also investigated. *Expectancy* refers to an individual's expectations of success in a particular domain. In essence, "what are the chances that I can ever be good at this?" The second factor is the *value* or importance the individual attaches to success in a particular domain: "How much do I care how good I am at this?" Eccles lists a variety of variables that can influence the second factor, such as gender role socialization that can lead to different core personal values and long-range goals, gender roles that affect the definition of *success* in areas important to one's identity, and the tendency of males to concentrate in one area, especially career, versus the female tendency to strive for competence in several areas simultaneously.

Lubinski and Benbow (2006) provide evidence of gender differences in areas of basic interest from a long-term follow-up study of mathematically precocious youth. They gathered data from students who had participated in the Study of Mathematically Precocious Youth (SMPY) begun by Julian Stanley at Johns Hopkins University 35 years before. They found that "[g]irls and women, on average, tend to prefer to learn about and work with people (or, more generally, organic content), whereas boys and men, on average, tend to prefer to learn about and work with things (or, more generally, inorganic content)" (p. 327).

Lubinski and Benbow use these gender differences in basic interests to explain the disproportionate number of the mathematically precocious males who went on to excel in math and the inorganic sciences and the disproportionate number of math-capable females who chose to excel in the life sciences and humanities. They conclude that this outcome

> does not necessarily imply a loss of [female] talent because the women secured similar proportions of advanced degrees and high-level careers in areas more correspondent with the multidimensionality of their ability-preference pattern (e.g., administration, law, medicine, and the social sciences). By their mid-30s, the men and women appeared to be happy with their life choices and viewed themselves as equally successful. . . . (p. 316)

A similar multidimensionality of purpose and orientation to others was noted by Dai (2002) in his review of motivation in gifted girls. He concludes: "Research has . . . consistently found that gifted girls in their adult lives tend to choose a more balanced than a career-focused life in their negotiation of career, relationships, and family responsibilities. . ." (p. 340).

Sears and Barbee (1977) provide evidence of the multiple paths that bright women can follow to personal fulfillment. They tracked down nearly two-thirds of the 671 gifted (IQ of 135 or above) girls that Lewis Terman had originally studied in 1922–28. The women averaged 62 years of age when they responded to Sears and Barbee's questionnaire. Two measures of satisfaction were used: one for the women's work histories (with "homemaking" treated as one type of work) and a more general measure of life satisfaction. Alhough there were numerous qualifying variables, in general single and divorced women were higher in work satisfaction, but married women were higher on the more general measure of life satisfaction. Sears and Barbee conclude: "Clearly, there is no single path to glory. . . . The life style which brings happiness to one woman with one kind of life experience does not necessarily bring it to another woman with a different experiential background" (p. 60). They go on to suggest, "It may well be that the coping mechanisms that enable the gifted women to adapt flexibly to a variety of conditions, and in whatever condition to find good satisfactions, are related to the intelligence they bring to their life situations" (p. 60). That is, greater intellectual capacity may make more life paths available to a woman and may also help her to appreciate more the paths she chooses.

One of the people-oriented occupations that women have been steered toward for generations is education. Reis (1995) studied 67 gifted women in a graduate education program. In general, the women reported that their parents encouraged them to do well in school but that they provided little encouragement to pursue a career after college. Instead, most of the women felt that their parents expected them to marry and have a family; if they did pursue a career, their parents expected them to put their family first. This understanding, plus the parents' gender role expectations, led them to promote careers like teaching. As one woman stated, "Father said no daughter of his would be allowed to be anything except teacher, social worker, etc. He would not pay for me to 'learn to be a man'" (p. 165). Despite pressures like these, only 4% of women thought that they had chosen the wrong career. In contrast, 60% thought that they had made the right career choice, and 36% were uncertain. Reis asked the women what fields other than education they were drawn to as adolescents. Interestingly, half of the women who said they were generally satisfied with their choice of education listed substantially different alternative career choices, particularly medicine. A 39-year-old who had skipped a grade said,

> I have taken many career inventories and on *every single one*, I was most interested in being a medical doctor. I believe I have a rather unusual skill of combining my talents in science with good interpersonal skills. I believe I would have been a compassionate and successful physician. Unfortunately, my family did not regard this as an appropriate career for a woman. (p. 164)

What do gifted women get back from the social networks to which they devote themselves? Hansen and Hall (1997) found that a supportive partner is an important element in the achievement of gifted women's own goals. They surveyed highly able female graduates of the University of Michigan when they were 45 to 65 years of age. Twenty-eight percent of these women had earned bachelor's degrees, 50% had earned master's degrees, and 17% had earned doctorates. Sixty percent of the women described their husbands as very supportive of their achievement efforts:

> In the survey and narrative responses, these women eagerly praised their husbands for their emotional support and in turn, told of their own willingness to offer such support to their husbands. Husbands and wives were interdependent. The phrase which these women most often used to describe their husbands

> was "emotionally supportive." Excellence was expected from both partners, and deep appreciation was obvious. (p. 174)

In preceding sections of this chapter, we have seen that gifted people differ in their perceptions of their gifts. This section has presented evidence that gender is one important variable on which these perceptions differ. Gifted women are more likely to attribute their successes to effort rather than ability. Gifted women have an even more mixed view of their giftedness than do gifted males, and gifted women tend to be more holistic and people-oriented in their choice of life paths.

How do we apply this information in useful ways? First, we inform women of high ability of these issues, sensitizing them to gender influences in our society which are so pervasive that we become blind to them. Secondly, we can provide positive female role models of all stripes to our talented women. Biographies of exceptionally capable women who have found satisfaction in traditionally female occupations, in traditionally male occupations, as unpaid domestic engineers, or in other creative options can give talented women a seed with which they can grow their own life path.

By the way, talented males should be included in some of these discussions on the futures of talented women. After all, the men will probably be involved in those futures as husbands, friends, or colleagues. Better understanding can make for better relationships of all sorts.

In Sum

Humans are complex creatures, motivationally speaking. Even when working within a single realm such as education and limiting the focus to the most academically skilled students, the factors facilitating or impeding achievement of academic excellence range broadly and interact complexly. Teaching is a goal-oriented form of communication. To be effective communicators, we must know our audience. As we continue to devise effective means of teaching our best students, we must also continue to learn who those students are. Information can be mined from the existing and growing literature on gifted students at elementary and secondary school levels, but we must expand that knowledge base more into the college years. The National Collegiate Honors Council has already begun to stimulate and support such research. It is in a key position to promote this important work.

As concerned educators, we try to stay open to new ways of being effective teachers. Sometimes, however, looking back to basics helps. From the beginning, teaching at its basis has been about one inquiring

mind turning on another to a new idea in a novel way. As one man immensely gifted in terms of both ability and motivation remarked: "Learning is mostly about creating a context for motivation. It's about why should you learn things. Technology plays a role, but it's not a panacea" (Bill Gates, 2007).

Endnotes

[1]See Anne Rinn's discussion of the big-fish-in-a-small-pond phenomenon in her chapter titled "Toward a Model of Integrative Learning: The Place of Science in an Honors Curriculum" in this volume.

[2]For more insights into reflective learning strategies, see John Zubizarreta's "The Learning Portfolio for Improvement and Assessment of Significant Student Learning" in this volume. Also, the dialogical model of learning described by Jim Knauer in "Dialogue, Politics and Pedagogy: Lessons from Democracy Lab" in this book could also be an effective means to accomplish this goal.

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CHAPTER SIX:
SIX HABITS OF HIGHLY INSPIRING HONOURS TEACHERS

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For me, honours was a wake-up call from the regular programme which I had followed. Through the honours programme my academic life became much more fun by undertaking my studies in a creative and innovative manner. Still now, in my working life, I try to remember that there is more out there "off the beaten track." This concerns not only my discipline of geography, but my life in general.

—Roeland Sluiskes, Managing Director of MKB Reva, a planning-economic consultancy office, Masterdegree, University of Utrecht, 2000

The key question presented to educators in the international honours community is how to teach honours to achieve the result exemplified by the feedback cited above from a Dutch honours alumnus. What role does an educator have to play as a member of the faculty, as a tutor, or as a researcher in order to provide an outstanding honours programme? What is the mission of honours education in teaching, in students' learning, in the programme itself? How does one ensure that the mission of the programme is fulfilled and that it elicits the positive feedback of successful graduates? In this piece, I offer six tips that reflect on the essential characteristics of an honours teacher. The six leads are based on literature surveys, qualitative and quantitative research gathered during academic years 2003–2006, honours experiences, and interviews with faculty teaching honours in Holland. Our list is certainly not exclusive, and others may find their own six or perhaps "seven habits" (to capitalize on Stephen Covey's popular scheme) by working in honours and through personal discourses with students and colleagues in their own programs and institutional settings.

The honours faculty member is a key factor in honours education not only because of his or her theoretical knowledge, research experience, and pedagogical skills but even more because of being a role model, a guide, and a master. Yet, the most important features of honours faculty have not been defined in any thorough, systematic way. We do not have a comprehensive, well-defined compendium of honours

pedagogy. Our knowledge about and insight into effective honours education have not developed at the same pace as the number of honours programmes in The Netherlands or elsewhere.

For example, in order to evaluate the actual success of honours programmes, we need specified and defined outcomes such as those identified in Lanier's (2008) recommendations for a thorough assessment plan in honours. We also need to make explicit our assumptions about the needs of students, faculty, and society, which honours programmes are said to meet. Our methods of evoking excellence in students through honours programmes need theoretical underpinnings. Fundamental to our understanding of effective honours programmes, we must gain a clearer insight into the characteristics and learning/teaching preferences of students and faculty participating in honours programmes. Who are those talented and motivated students who are able to do more than the regular programme can offer them? What kind of programme will challenge those students? Who are those teachers dedicating their time and energy to honours? The latter question is the focus of our present discussion, and an ideal image comes to mind. Professors of an honours programme motivate and inspire creative students with a critical, analytical mind and a curious attitude; honours teachers have high expectations of their students; honours professors have the gift to teach their subject within a broad academic and social context; and honours teachers are available on a day-to-day basis. Achieving such qualities is demanding but exciting for the engaged honours teacher, and the six habits that follow are essential factors in distinguishing, motivating, and celebrating honours teaching.

Habit One: Authentic Teaching

The first habit is to be authentic as a teacher. Authenticity means being open, forthright, observant, appreciative, and honest. In being authentic, teachers will have an eye for detail, and teachers will show and share their humanity. The authentic teacher cultivates a standard of intellectual excellence applicable to any walk of life and fosters habits of thought, mind, and heart that lead to a lifetime of inquiry, curiosity, and learning. Authenticity quickens faculty to respond positively to calls in honours curriculum for experimental learning strategies, leadership projects, and collaborative feedback sessions—the kinds of pedagogies that go beyond mass acquisition of content knowledge to forge meaningful mentoring relationships that often define the honours experience for both teachers and students. Special care should be given

to ethical and spiritual issues in authentic teaching and learning moments, and so I emphasize that in order to be authentic, teachers must exhibit courage when teaching.

Habit Two: The Courage to Teach

The second habit is to have courage. Educators must dare to be different, dare to go against the accepted norm if necessary. An educator must have courage as a teacher and respect those students who are different. Sometimes, students with critical questions, creative behaviour, and innovative ideas can seem disruptive because they can demand considerable time. However, remembering our second tip is essential to stimulating such students instead of making them conform to the behaviour of the rest of the class. With courage, a teacher's aim can be to nurture real honours learners who are genuinely motivated, intellectually curious, intrinsically eager to cross disciplinary boundaries, undaunted by risk and challenge. Educators must dare to give students freedom and responsibility for their own learning. They must dare to be critical, analytical, discriminating, and exacting to help students grow, learn the value of feedback, and embrace high expectations for themselves and others. Also, while promoting rigor and higher-level learning, teachers must dare to be supportive and to provide encouragement.

Habit Three: The Challenge of Honours

The third habit is to be challenging. A professor can only challenge when he or she is knowledgeable. A good researcher will show in his or her teaching and research the relationship between academia and society. This lesson reminds teachers to invest in their own education, in their own research, and in their own personal and professional development, believing that a life in balance leads to honours. The honours challenge is academically rigorous; it offers more depth in content knowledge and skill development. Hence, honours should be not just more work but work that is intellectually challenging in complexity. To challenge students, honours pedagogy should be substantively different from what is done in regular courses. Teachers can make academic work more difficult simply by adding to the quantity of tasks and accelerating the pace of study, but it is far more interesting when the commonly called "tyranny of content" gives way to another view of honours education predicated not on amount or speed of work but rather on the quality, depth, creativity, and alternative assessment and evaluation

of learning. Students will find honours challenging by going out of their comfortable, predictable ways of learning. Such practice places great demands on students and, reciprocally, teachers must invest time in giving thoughtful feedback and developing a genuine interest in the student's abilities and possibilities for success.

Habit Four: Relationships

The fourth habit is to invest in relationships. The relationship between teacher and student has been cited by several studies as crucial for effective teaching of gifted secondary school students (for an overview, see Vialle & Quigley, 2002; Vialle & Tischler, 2005). Similarly, honours students have reported the importance of the faculty's being interested in their work (Wolfensberger, 2004). Faculty, then, must foster talented students' curiosity and their enthusiasm for complex questions. Research in Dutch contexts indicates that honours students have more social interaction with the faculty than non-honours students have with their teachers, and I speculate that the same is true about high-achieving students elsewhere. Besides investing in the social dimension of such contact, the faculty can invest in creating an academic community by inviting students into research teams or by encouraging publication of students' work when it seems appropriate. Of course, community service projects can also create strong relationships.

The teacher also plays an important role in fostering meaningful, productive relations not just between instructor and students but also among students themselves. There are different means to obtain the highly prized virtue of honours community among students. Faculty can give group assignments, organize group events, or facilitate effective class discussion. Formative midterm collaborative assessment strategies such as Small Group Instructional Diagnoses (SGID) or Critical Response (Zubizarreta, 2003) can also be conducive to fostering good relationships among students and between the students and the teacher. Teachers can invite students to engage their peers and professors in scholarship and interdisciplinary learning. An academic honours community, however, should go further than the classroom, so extracurricular activities, social events, round-table discussions, leadership ventures, and community service projects should be part of a well-developed programme. These endeavors cultivate habits that help students to learn how best to speak, to listen, and to attend to the voice of their inner vision and creative imagination.

Also, the imperative of community or connections in honours extends to the faculty themselves, who should not think exclusively about their own disciplines and individual classrooms. Interdisciplinarity and faculty collaborations should be important parts of the honours experience. Professors should collaborate to share across subject areas and hierarchies. Honours curricula and professors should push the boundaries of interdisciplinary studies while having a firm foundation in disciplinary thinking, scholarship, and independent research. Such connections across the highly guarded areas of content and the frequently private domain of the classroom are part of the challenge of honours education.

Habit Five: Honours as Powerful Symbol

The fifth habit is to walk the talk. Teachers must know their own passion and vision and show them to their students. If teachers have high expectations of their students, then they must deliver substantive work themselves. If they want students to hand in their work on time, then they must be on time. If they believe their academic work is important for society, then they must include the results in their lessons. Educators must be consistent, must communicate clearly, and must clarify expectations. Because teachers ask from their students appropriate behavior, a positive attitude, good academic work habits, commitment to their own goals and to society, they must also exhibit these same qualities themselves. This notion sounds logical, yet this habit is difficult to practice. Universities and colleges are complex institutions with many different, competing urgencies: everything and everybody demand attention. Too easily, teachers lose proper focus and the ability to make prioritized choices. After all my years as honours director and honours teacher, I strongly believe that honours education is an excellent way to help faculty sharpen their interests in pedagogical innovation, reorient themselves to a refreshing student-centered philosophy of outstanding teaching and learning, and achieve the best education for everybody. Preparing honours classes is a way to be on the edge but with a focused educational mission in mind. Honours can be a powerful symbol and model of what authentic teachers really believe about deep, engaged learning, and we should always resolve in honours to walk our talk.

Habit Six: Living the Dream

The sixth habit of inspiring honours teachers is the most difficult and important one: living the dream. Our research in Holland (Wolfensberger, 2004) has demonstrated that honours students appreciate professors who are experimental, innovative, flexible, and authentic; faculty who share their personable qualities; teachers who relate well to their students. Honours students want teacher-scholars who share their passion for their subject and for teaching and who challenge students to give their best.

No single honours programme, teacher, or student will ever achieve the perfect honours experience. Our honours programmes will be, fortunately, imperfect, leaving room for constant innovation and exploration of the ideal teaching and learning moment. Such imperfection, an acknowledgment of the hard work that still lies before us in honours, is fortunate because it propels our dreams as teachers. Therefore, I will not offer a seventh tip to echo Covey's common, popular scheme for success. Instead, I invite other teachers to dream and to make their vision of honours a reality in the future of their programmes, their faculty, and, most importantly, their students. What would be *your* seventh habit?

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CHAPTER SEVEN: THE TEACHING AND LEARNING FISHBOWL

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For years, the Teaching and Learning Committee of the National Collegiate Honors Council has sponsored one of the most popular sessions at the organization's annual conference. The "Teaching and Learning Fishbowl" has become a perennial favorite because of its focus on students' perceptions of what has delighted or disappointed them in their academic experiences in honors and other courses. The Fishbowl model works because it places a premium on taking students' feedback seriously and using students' ideas and suggestions for improving teaching and learning. The model is certainly not restricted to honors or stepped-up, differentiated classes or programs, but it is applicable across a variety of educational situations, helping faculty and administrators to keep a close touch on the pulse of student learning and satisfaction. Faculty and student reactions to the event at annual honors conferences corroborate that the Fishbowl is a definite hit.

Speaking frankly about what works and what does not in honors-level teaching and learning practices, the students sit in the round in the center of a large room and engage each other in honest conversation while the audience sits silently and attentively outside that perimeter. A facilitator, usually a member of the standing committee, maintains the momentum of the session by posing specific questions and making sure that the discussion remains relevant, candid, and constructive. The lively exchange always generates new or reaffirmed insights into what students value in their classes and teachers, and the atmosphere in the room is charged with spirited discourse.

In the early planning stages of the Fishbowl, the facilitator selects students from a variety of institutional types to ensure a diversity of perspectives during the dynamic interaction. The facilitator shares specific questions or prompts with the students before they arrive at the national conference, advising them to reflect on the topics and be ready to share their responses, recommendations, and stories with other students in the bowl. One of the ground rules is that students should be honest, reflective, and detailed, but respect and privacy should prevail, and no individual student or faculty names or specific courses should

be named. The facilitator does not permit the audience to interrupt the flow of conversation among the students until near the end of the session; then the facilitator opens the floor for additional interaction.

The Fishbowl is successful year after year because students' voices matter. When students speak their minds in a structured, supportive, appreciative environment, their feedback becomes a valuable asset for improving what we do in the classroom and in our programs to challenge high-achieving, talented learners. The outcome of the yearly Fishbowl session at NCHC suggests that students do assess their academic experiences fairly and intelligently.

One example of a Fishbowl event sufficiently conveys the value of the activity. At the 2006 NCHC conference in Philadelphia, Pennsylvania, the Fishbowl participants reflected on four broad topics:

1. What has been your best honors learning experience and why?
2. What are the qualities that distinguish the effective honors teacher?
3. Describe one of your less successful honors learning ventures. Why was it disappointing?
4. Has honors engaged you in an intentional learning community? Have you felt a sense of community in honors? Any bars to community?

The ensuing dialogue was rich with both positive stories and disappointing accounts—all helpful in providing listening teachers, students, and directors with ideas for improvement, new ways of redesigning courses, teaching strategies, assessment methods, and programming initiatives. Here is a brief distillation of the animated interaction among the students from notes taken at the session:

What has been your best honors learning experience and why?

- Application of learning through out-of-class or field experiences.
- Small classes.
- Team-taught seminars; learning that different professors have different views, but that they can learn from each other and from us.
- Variety of learning activities: in class, out of class, with peers, with teachers, with alumni, with professionals (internships).
- Class community.
- Learning how to do primary research guided by a mentor.
- Interactive classes, lots of discussion.
- Faculty with fervent passion to motivate students.

- Relationships between faculty/director and students outside class, resulting in students' commitment and motivation.

What are the qualities that distinguish the effective honors teacher?

- Teacher as a guide, not overbearing; teacher partners with students in learning.
- Adaptive, flexible.
- Creative; every day is exciting; we are surprised by teacher.
- Makes students interested in the subject; we want to learn more.
- Teaches not only facts ("garbage in . . . garbage out"), uses questioning, engages students, helps students think for themselves.
- Humor.
- Clear grading policy, supportive in improving work, encouraging.
- Goes outside the book, sparks student intellectually like a moderator, not obsessed with covering all the material, leaves room for unexpected learning.
- Enthusiastic, passionate.

Describe one of your less successful honors learning experiences. Why was it disappointing?

- Death by PowerPoint.
- Total lecture is awful; better to be more interactive, use dramatizations, discussion, hands-on activities.
- Rigid, inflexible attitudes of professor toward individual student, not acknowledging compelling needs or other opportunities for learning, e.g., presenting at a conference with no make-up options.
- Inconsiderate teacher, unrealistic expectations of students, maybe even stereotyping honors students.
- Unsuccessful group work, not well organized, unclear outcomes.

Has honors engaged you in an intentional learning community? Have you felt a sense of community in honors? Any bars to community?

- Residence hall option is great; we are close, help each other study and succeed.
- Lounge for students helpful: study and relax, make friends.

- Open-door policy or atmosphere in honors center is important for community; need to be careful of stigma of elitism, which harms community not just among students outside the program but also inside.
- Field events, excursions build community spirit.
- Honors advisement: go beyond course selection; foster community, too.
- Phone tree idea: connects students to each other and to faculty and directors.
- Bars to community: jobs, families, individual preferences or learning styles, consuming major requirements, assumptions that students already know each other.

The sincerity of the students' stories and their genuine desire to share both good and bad experiences for the purpose of improvement were palpable during the Fishbowl session in Philadelphia, a quality of the event that is difficult to capture in sketchy notes. As the saying goes, one had to be there to appreciate fully the potential inherent in the Fishbowl for coming away with a refreshing view of the power of student feedback. Certainly, the reflective teacher or student could expand the lists above and ponder the many pedagogical lessons implicit in the abbreviated comments.

Fishbowls yield valuable results, and they are relatively simple and swift to set up. The model is easy to replicate in a variety of institutional contexts, course subjects, class sizes, and program needs (e.g., improvement of teaching and learning or assessment and evaluation). Here are some ideas of when and how Fishbowls can be implemented to advantage:

1. Opening exercise on first day of class to gauge student readiness, backgrounds, expectations.
2. Midterm formative feedback to take pulse of student learning, course effectiveness, teacher performance.
3. Critical moment for reflection and collaborative feedback in response to difficult incidents in the classroom.
4. Augmentation of or even substitute for oral examination of content knowledge.
5. End-of-term assessment or evaluation of teacher and student performances in course.

6. Workshop model for collecting faculty and/or student perspectives on a major, program, or activities such as orientations, internships, or study abroad experiences.
7. Collecting faculty/student/staff insights, experiences, visions, and goals for assessment/accreditation.

The Fishbowl is an activity about which students are enthusiastic, one they take seriously when they are coached properly, and one that heightens faculty respect for students' perspectives on what constitutes good teaching and learning. It seems mundane to repeat what may seem baldly obvious, but sometimes if we want to know what our students are really learning and how they really perceive our teaching, subject matter, programs, and other dimensions of our academic endeavors, maybe we should just ask them! The Fishbowl can provide an excellent framework for such collaborative conversation.

Part Three:

Pedagogy: Practices and Issues

So much to do, so much to say, and so little time and space! A chapter on pedagogical approaches and issues within the frame of honors-level education for academically talented students could easily grow into a full-scale book, full of innovative strategies, models of success, samples of effective assignments and activities, theoretical perspectives on higher-order learning and specialized teaching, and more. Perhaps the next volume in the NCHC teaching and learning monograph series will pick up the call.

For now, this modest selection of essays explores three important topics for enriching teaching and learning in courses and programs designed to motivate and challenge high-ability students.

John Zubizarreta argues that the learning portfolio is both a product and a process that enriches and extends students' educational experiences in honors programs by placing a premium on challenging students to transcend common levels of achievement. Learning portfolios have power because they emphasize the place of deep, meaningful learning and the value of rigorous assessment of evidence of learning and because they incorporate the benefits of mentoring and collaborating to support significant learning. The portfolio concept, now almost ubiquitous in higher education, is particularly well-suited to honors-level courses and programs, helping talented students to be not just strong acquirers of knowledge but also reflective learners, metacognitively aware of what, how, when, and why they learn.

Clarifying the term "deep learning" and sharing her considerable expertise in working with faculty to rethink their classroom strategies to promote critical thinking and active learning, **Barbara Millis** writes about sequencing course assignments and assessments to ensure that

students move beyond lower levels on well-known taxonomies of learning to higher levels involving application, analysis, synthesis, and evaluation. Millis provides several examples of active-learning exercises and other methodologies such as collaborative/cooperative learning techniques to enhance student learning.

On the issue of what kind of environment facilitates the best kind of learning in the courses that typify honors, gifted, or differentiated curricula for highly talented students, **John Zubizarreta** concludes that the small class provides a rich setting for deeper, more active and engaged learning. Reviewing the vast literature on class size in K–12 and higher education, Zubizarreta also underscores an important caveat in the results of such studies: faculty development is key in any effort to promote better learning, whether the class is small or large. Teaching the small class requires proper training in order to ensure a match between goals and methods, methods and outcomes, teacher and students, activities and assessment. When such connections are made in the well-designed advanced course, then the results provide some powerful models of teaching and learning in our classrooms.

CHAPTER EIGHT: THE LEARNING PORTFOLIO FOR IMPROVEMENT AND ASSESSMENT OF SIGNIFICANT STUDENT LEARNING

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The learning portfolio is a rich, convincing, and adaptable method of recording intellectual growth. It involves students in a critically reflective, collaborative process that augments learning as a community endeavor and deepens students' educational experience. That portfolios are flexible and can be custom-tailored to suit many disciplinary, pedagogical, programmatic, and institutional needs accounts for the continually growing use of portfolios worldwide. Indeed, the overwhelming number of online resources and models now available on the popular electronic portfolio, the digitized approach to portfolio development, can consume anyone who searches for such information on the internet. Book and article publications have increased dramatically in the last decade. Portfolios now are deeply ingrained in higher education as a powerful strategy for improving and assessing student learning, and their utility in augmenting higher-level learning among strongly motivated, creative, risk-taking students who respond well to the challenges of reflective learning is especially notable. Honors programs and other approaches to meeting the learning styles and needs of high-ability students, after all, privilege the kind of "deep," "reflective," or "significant" learning identified by educational theorists from Dewey (1910) to Perry (1970), Piaget (1971), Schön (1983), Kolb (1984), King and Kitchener (1994), or Fink (2003). Often, however, honors directors, teachers of gifted students, and other academic leaders responsible for our most talented students are challenged to produce authentic evidence of the value of honors or other stepped-up alternatives in education, and they often do not have appropriate mechanisms for meaningful reflection and assessment. The learning portfolio is one approach that works.

The concept of the student portfolio has been widely known and implemented for some time in academic fields such as writing or business. Similarly, portfolios have been a staple form of documentation of performance skills in the fine arts, providing students and teachers in

the arts disciplines with a method for displaying and judging evidence of best practice and samples of the full range of talent. Other popular applications have been for demonstrating the value of experiential learning or for assessing credit for prior learning. Also, in teacher education, portfolios have been used commonly as effective tools for showcasing a representative breadth of acquired skills for professional success and career preparation, using specified licensure competencies as benchmarks against which to measure achievement. Students and faculty advisors share some portfolios for the purpose of academic and career advising.

Despite the history of portfolios in certain disciplines, the portfolio approach to gauging student accomplishments and growth in learning, while not entirely new in higher education, has historically received more attention in the K–12 arena. In English and a few other disciplines in college classes, portfolios and journals have been employed with some regularity, but higher education, remarkably, has lagged behind the grade schools in innovating and refining such persuasive learning tools. Today, following the groundswell of interest in teaching, course, and institutional portfolios, learning portfolios are now attracting significant attention in college and university settings. Now, the numerous web sites that exist for online information on portfolios, offering rich and diverse models especially of how electronic or digital portfolios are used worldwide for multiple purposes, are coming predominantly from colleges and universities around the world. Countries such as Australia, Britain, The Netherlands, New Zealand, Canada, France, Finland, Hong Kong, Mexico, Singapore, and, of course, the United States, just to name a few, are home to institutions with student portfolio programs to help with systematic, learning outcomes assessment plans. Learning portfolios are clearly now mainstream in higher education.

Although the trend is rapidly changing, often what is left out of the formula in student portfolios is an intentional, primary focus on the learning piece, the deliberate and systematic attention not only to skills development but to a student's self-reflective, meta-cognitive appraisal of what was learned, how it was learned, when it was learned best, and, more importantly, why learning has occurred at all and why learning is valuable. This comment is not to assert, of course, that learning does not happen when portfolios are used only as collection and organizing devices, that a student does not benefit simply from the thoughtful act of choosing representative samples of accomplished work and making sense of the materials as a display. Any effort to organize one's learning experiences is a step in the right direction of moving students away

from merely completing courses, recording grades, and checking off boxes on curriculum plans to a more mindful understanding of the integration and potential of their learning over time. Enriched learning—the kind most valued in honors curricula and other programmatic activities dedicated to supporting higher-level, focused, thoughtful learners—is therefore likely to occur if the student is encouraged to come to terms self-consciously throughout the duration of an academic endeavor. The endeavor may be a semester course, a teacher training program, the achievement of general education goals, a field or lab experience, an internship, a study abroad venture, the attainment of a degree, or the completion of an honors program. The kinds of key questions that prompt meaningful reflection about learning over time may include the following:

- How have such products as those collected over time in a portfolio contributed to higher-order learning?
- What has the student learned from the process of generating the work, collecting it, selecting it, analyzing its value, and pondering its integration and future applications?
- How does the work fit into a larger framework of lifelong learning that transcends simply completing graded assignments?
- Why was the work valuable in the student's overall cognitive, social, and ethical development?

That opportunity for mentored, critical reflection and for immediate assessment of learning grounded in direct outcomes or products can benefit all our students but especially those who are most motivated and most responsive to reflective learning pedagogies. Also, such work can benefit an honors program or some other academic organization looking for ways to demonstrate the value-added dimension of its influence on students' learning. More importantly, this opportunity has a great impact on students' appreciation for and understanding of the visible, recorded, shared evidence of the outcomes of their reflective learning.

Such probing of the sources, coherence, and worth of learning—especially when combined with the power of collaboration and mentoring in making learning a recorded, shared, community endeavor—is sometimes missing from the model of the student portfolio as simply an individual repository of selected artifacts. Such a model is useful, but reflection and collaboration are fundamental to reaping the full advantages of learning portfolios. Honors programs are particularly well suited to creating both inside and outside the classroom

learning environments that foster the development of a reflective learning community. With a well-known emphasis on deeper and not just more or accelerated learning, college honors pedagogy lends itself to reflective-practice strategies ranging from challenging critical-thinking assignments (see Millis in this volume) to journals, creative projects involving meta-cognitive work, discussion, self-assessments, collaborative/cooperative/team-based ventures, educational games/simulations, City as Text™ experiential learning (see Braid in this volume), technology-based exchange forums, or deliberative/dialogic discourse (see Knauer in this volume). Such pedagogies, which are ubiquitous in the world of honors teaching and learning but not necessarily restricted to honors programs alone, generate the intellectual growth and the quality of learning outcomes readymade for portfolio development.

The Importance of Reflection

As already mentioned, most commonly, student portfolios have been used to collect and evaluate students' work at key points in their progress, usually at the end of an academic endeavor. Writing about portfolios with "a focus on product" for the purpose of certification in teacher education, Campbell, Melenyzer, Nettles, & Wyman (2000, p. 14) make the strong point that in a well-managed portfolio, students should realize that their effort is not simply to construct "a scrapbook of college course assignments and memorabilia" (p. 2). Instead, a learning portfolio should stress that the product is also a process, an "organized documentation of growth and achievement that provides tangible evidence of the attainment of professional knowledge, skills, and dispositions. Each portfolio is goal-driven, original, and reflective" (p. 13). The intrinsic merit of learning portfolios is that they involve students in the power of reflection, the critically challenging act of thinking about their learning and constructing and communicating a sense of the learning experience as a coherent, unified developmental process. Such thinking and sharing are the linchpins of lifelong, active learning and the keys to helping students discover, understand, and communicate what, how, when, and why they learn. Emphasis on depth and critical reflection is also one of the chief aims of honors education and other approaches—such as undergraduate research, learning communities, problem-based learning, or peer mentoring—to stimulating high-ability students.

For talented, creative, reflective learners who respond readily to risk and challenge, the value of portfolios in improving student learning resides in engaging students not just in collecting representative samples of their work for assessment, evaluation, or career preparation but in addressing vital reflective questions that invite systematic inquiry:

- What have I learned? Why did I learn?
- When have I learned? In what circumstances? Under what conditions?
- How have I learned or not, and do I know what kind of learner I am?
- How does what I have learned fit into a full, continual plan for learning?
- What difference has learning made in my intellectual, personal, and ethical development?
- Where, when, and how have I engaged in integrative learning? Has my learning been connected and coherent?
- Is my learning relevant, applicable, practical?
- When, how, and why has my learning surprised me?
- What have been the proudest highlights of my learning? The disappointments?
- In what ways is what I have learned valuable?
- What difference has honors, undergraduate research, or learning communities made in my learning?

Obviously, many more questions come to mind as one fashions a strategy for reflection.

The underlying message, however, is that the learning portfolio is an opportunity for developing the reflective judgment (King & Kitchener, 1994) and higher-order or significant learning (see Bloom, 1956; Fink, 2003) that we desire in students of all abilities but certainly in students who come to higher education with aptitudes, learning styles, skills, and goals that typically identify them for programs designed to take their intellectual talents to a higher level. Compare the reflective prompts above with the challenging questions posed by Lanier (2008) in the context of a practical program for honors assessment, and one sees readily how and why reflective practice serves not only to enrich student learning but also to provide a strong foundation for meaningful and useful assessment and evaluation:

- What have honors students actually learned?
- What is the educational value provided by an honors program or college?
- What have honors students learned or gained from participating in honors that their non-honors counterparts have not?
- What gains in student achievement and learning have been made through the substantial investments in "living-and-learning-communities," undergraduate research opportunities, cross-, multi-, and inter-disciplinary programs of study, international experiences, special honors advising, and the like?
- Why is honors important?
- Why should honors be funded? (p. 83)

Such reflection is facilitated best not by leaving students individually to their own devices in thinking about their learning but by utilizing the advantages of collaboration and mentoring in making learning (as well as teaching) what Lee Shulman (2004) calls "community property." Learning is enhanced by recognizing its relational values, by helping students connect individual pieces of gained knowledge to a larger puzzle of learning with ever-widening intellectual, material, ethical, social, even spiritual implications. In other words, dissemination of facts and delivery of knowledge are acts of instruction that serve an important but hierarchically lower purpose in how we think and learn. The popular writer Eric Hoffer (1973) offers this aphoristic quip: "In a time of drastic change it is the learners who inherit the future. The learned usually find themselves equipped to live in a world that no longer exists" (Aph. 32). That is, in a world where knowledge is continually deconstructed and redefined in a dizzying instant, learners, or those who invest in learning as process and transformation, will triumph over the learned, or those who invest in learning as a determinate set of facts. Higher-order teaching and learning are the shared acts of a reflective discourse community, a dynamic "collaboratory" of living, changing ideas that transform both teacher and learner.

What Is a Learning Portfolio?

What is a learning portfolio? No single, right answer exists. Engaging students not only in collecting selected samples of their work for assessment, evaluation, and career development but also in continuous, collaborative reflection about the process of learning is a

powerful complement to traditional measures of student achievement. Such portfolio work can take a variety of forms. The flexibility of portfolio development is actually one of the strengths of the process because the portfolio is adaptable to many different purposes, and the product can be on paper, on CD/DVD, on video/audio tape, on the web, or on some other creative combination of such media.

The learning portfolio, then, is a *flexible, evidence-based* tool that engages students in a process of continuous *reflection* and *collaborative analysis* of learning. As written text, electronic display, or other creative project, the portfolio captures the scope, richness, and relevance of students' learning. The portfolio focuses on purposefully and collaboratively *selected* reflections and evidence for both *improvement* and *assessment* of students' learning.

A useful model for the learning portfolio involves a concise, reflective narrative plus selected evidence in a series of appropriate appendices. Such an approach parallels successful models for professional teaching (Seldin, 2004; Zubizarreta, 1995, 1997) and administrative (Seldin & Higgerson, 2002) portfolios. The role of the collaborative mentor (a teacher, an advisor, or peer) is to help the writer keep the portfolio manageable, current, accurate, and relevant to one's purpose. As new materials are added, dated or no longer useful items are removed, keeping the act of revision active and critical, continually informing the learning process.

The Contents of a Learning Portfolio

What are the contents of a learning portfolio? Again, no answer can be exclusively right or complete. Portfolios vary in purpose, and different purposes determine the diverse contents. For example, a portfolio developed for a single course designed for top undergraduate majors or a half-year, experiential National Collegiate Honors Council Honors Semester might differ in purpose, themes, documentation, and reflective content from a portfolio constructed initially in a first-year, interdisciplinary honors orientation course and later completed in a capstone senior seminar as part of a programmatic assessment plan focused on quality enhancement and added value. Some portfolios might focus exclusively on improvement, and some might be used primarily for formative assessment or summative evaluation, changing the character and content of the endeavor. Without doubt, flexibility and adaptability are among the portfolio's practical strengths.

Generally, the learning portfolio consists of a carefully reasoned, reflective narrative that, depending on purpose, captures the scope, progress, and value of learning, complemented by an equally representative compilation of concrete evidence. A popular alternative is a number of short reflections on separate or grouped items of evidence. Much can be said, though, for the coherence and unity of reflective analysis required in a single reflective statement and overview with keyed references to evidence in an appendix. Some portfolios mix the approaches, offering individual, brief reflections for units of organized materials that demonstrate growth in particular areas of learning (perhaps keyed against stated learning goals and objectives of a course or a program), while also including a longer, thoughtful, retrospective critical analysis of learning over time in a more developed reflective narrative.

Here is a generic table of contents, organized by broad categories and certainly not prescriptive or exhaustive. The table is meant to be suggestive, inviting multi-disciplinary ideas of what the actual, complex contents of a student portfolio might be. The sound portfolio will not necessarily follow the table exactly as written, but it will certainly include reflections and appropriate evidence that address the categories. Obviously the purpose will drive final decisions about both reflection and documentation:

Table of Contents

1. *Philosophy of Learning* (reflective narrative[s] on learning process, learning style, value of learning).
2. *Achievements in Learning* (records: transcripts, course descriptions, résumés, honors, awards, internships, tutoring).
3. *Evidence of Learning* (outcomes: research papers, critical essays, field experience logs, creative displays/performances, data/spreadsheet analyses, course listserv entries, lab results).
4. *Assessment of Learning* (instructor feedback, course test scores, exit/board exams, lab/data reviews, research project appraisals, practicum reports).
5. *Relevance of Learning* (practical applications, leadership, relation of learning to personal and professional domains, ethical/moral growth, affiliations, hobbies, volunteer work, affective value of learning).
6. *Learning Goals* (response to feedback; plans to enhance, connect, and apply learning; career ambitions).
7. *Appendices* (selected documentation).

The general categories of the table, again, are suggestive; each portfolio project will define specific contents in different ways, depending on purpose and learning goals and objectives. The categories, however, reflect a logical pattern, one that essentially mirrors sound practice for both improvement and assessment. The flow parallels this order of reflective analysis, complemented by documentation in the appendix:

- What, how, when, why did I learn?
- What have I accomplished with my learning?
- What products, outcomes do I have to demonstrate learning?
- What measures and accounting do I have of my learning?
- What difference has learning made in my life?
- What plans do I have to continue learning?
- What evidence supports the claims made in this portfolio?

A brief reflective section of a few pages, plus a mindful, organized selection of integrated evidence of authentic learning, is a practical investment for the student, who benefits from both the portfolio's efficacy in bolstering learning and its being a compelling showcase product for a job search, graduate application, or other purpose. The teacher, too, gains a multi-faceted means of appreciating, understanding, and assessing a student's learning, using a model of authentic, educative assessment as described by Allen (2004), Suskie (2004), Wiggins (1998), and others. Also, programs and institutions have at their disposal a visible sign of learning over time for assessment, evaluation, or accreditation needs.

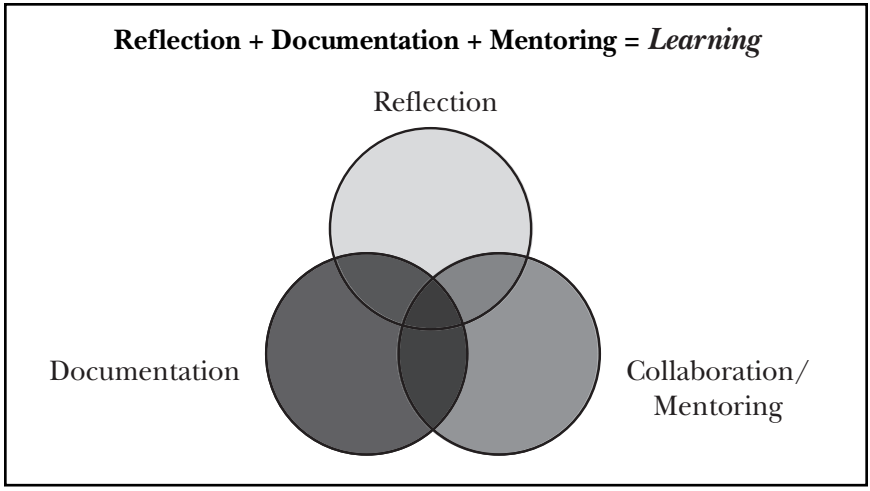
A Learning Portfolio Model

Recognizing that student portfolios take many forms, depending on purpose and individual or programmatic design, I propose a simple model for the learning portfolio predicated on three fundamental components:

1) Reflection 2) Documentation 3) Collaboration

Any combination of two assures a deeper learning experience, but when students activate all three components in a portfolio project, the potential for enhanced learning is most stimulated. The result is a compact, strategically organized document that evolves qualitatively as a reflective process to represent the dynamic nature of engaged learning. (See Figure 1.)

Figure 1. The Learning Portfolio



As a help in beginning to craft a portfolio project, here is an exercise from *The Learning Portfolio: Reflective Practice for Improving Student Learning* (Zubizarreta, 2004), which will prompt careful thinking about the three essential activities in portfolio development. Faculty must consider how reflection will be incorporated into a portfolio, what kinds of and how much evidence should support the portfolio, and who will provide the mentoring and collaboration so crucial to guiding substantive reflection and judicious, honest display and analysis of evidence. (See Figure 2.)

In designing a portfolio project, faculty members must keep in mind the importance of selectivity in the compilation of outcomes or products that comprise the appendix items supporting the reflective narrative portion(s) of the portfolio. Selectivity is better defined as *representative* rather than as *culled*; although in a showcase portfolio that is used most often for job preparation, graduate school application, or similar professional purposes, the materials chosen as documentation naturally would reflect best practice. Again, purpose is a central consideration in determining the themes and evidence of a portfolio. Still, any portfolio gains a certain credibility and is not necessarily handicapped by including artifacts that reveal the author's reflective awareness of weaknesses in academic areas or particular work applications requiring improvement. In fact, a portfolio is an ideal venue for demonstrating revision and growth over time, effective responses to formative feedback, and understanding of what steps are needed to strengthen learning and actual performance in the future. Usually, students who are

Figure 2. Crafting a Learning Portfolio Project

Think about how you would design a learning portfolio project for your classroom, program, or institutional use.

1) What kinds of reflective questions would you ask students to address?
2) What kinds of evidence or learning outcomes would be most useful?
3) How would you engage students in collaboration and mentoring in the process?

Purpose of Portfolio: _____

Reflection	**Documentation/ Evidence**	**Collaboration/ Mentoring**

highly motivated and talented find such a focus on the *process* of their learning challenging and rewarding because reflecting on and documenting their progress as learners reinforces for them that one of the reasons they are successful as learners is that they have a disposition to value feedback and respond positively to incentives for improvement.

Figure 3 is another table to help in mapping out a portfolio's purpose, themes, and evidence (Zubizarreta, 2004). The items shown in the table are not at all prescriptive or exhaustive, but they underscore how the purpose of a portfolio drives its themes, which are supported by the evidence or outcomes of learning assembled selectively in the portfolio. A productive exercise to add to the one above for crafting a learning portfolio project (Fig. 2) would be to complete a table similar to the one in Fig. 3, with columns for purpose, themes, and evidence.

In the process, and preferably in a collaborative setting for generating creative ideas and models, the design of a portfolio would capture the complexity, individuality, and value of student learning. What is the purpose driving the portfolio project? What are the salient, recurring, integrative themes of the portfolio? And what selective cache of

outcomes or documentation provides the vital evidence that undergirds the portfolio's critical reflections? If the portfolio is designed by high-ability students with an already strong base of considerable skills,

Figure 3. The Importance of Selectivity in Contents of Learning Portfolio

The concrete evidence of learning in a portfolio is collected selectively in an appendix. The materials meet the specific purposes of the portfolio. The representation of student work, or products, in the appendix is linked to the reflective component of the learning portfolio, and it is driven by purpose and audience. For example, the following chart suggests some representative ways in which the *purpose* of a learning portfolio strongly determines the *themes* of the reflective narrative as well as the types of *evidence* selected in the appendices.

Purpose	Themes	Improvement
Improvement	Development, reflective inquiry, focus on goals, philosophy of learning.	Drafts, journals, online threaded discussion, emails, statement of goals, classroom assessments, research notes.
Job Search	Career preparation, versatile skills, ambitions, potential for future contributions, flexibility.	Showcase projects, writing & communication samples, résumé, references, internship evaluations, certifications, reports/logs, computer programs, awards, transcripts.
Writing	Voice, creativity, diverse & flexible skills, craftsmanship, facility with language, research proficiency.	Essay drafts, journal, listserv or threaded discussion entries, research paper, publications, concept maps or outlines.

Purpose	Themes	Improvement
Prior Learning	Mastery of content.	Products demonstrating skills & competency, references, achievement/placement test scores, interview transcript.
Problem Solving	Critical thinking, creativity, application of knowledge, flexibility, curiosity.	Problem-solving log, lab reports, computer programs, spreadsheet data analyses.
Field Experiences	Application of knowledge, trained skills, adaptability.	Field journals, logs, reports, video/audio tapes, photos, project leader's evaluation, grant proposal, publication.
Honors Program/ Higher-Level Learning	Challenge, risk, creativity, reflection, motivation, self-directed worker, preparation, higher-level skills, collaboration, service, leadership, value-added education.	Application or first-year essays alongside capstone retrospective essays, senior thesis/project, essays/labs/projects in draft and final forms with feedback and responses, academic presentations (programs, handouts), creative performances (video, audio, programs, reviews), service/leadership records, photos, posters, awards.

the themes might focus more on improvement, creativity, and the added value of stretching intellectual limits in a challenging academic program or learning community. In turn, the types of documentation necessarily would be not only end products of exemplary work but rather evidence of growth over time and demonstrations of motivation to improve learning, recognize areas of development, and reflect on learning as a lifelong process.

Final Thoughts

The learning portfolio is a concept that is strongly suited to enhancing learning and ratcheting up intellectual achievement to the level we expect in all kinds of advanced learning programs. It is an especially robust strategy in the context of honors programming or other pedagogical structures for educating talented, higher-level learners because of its emphasis on critical reflection and assessment. The portfolio challenges teachers, program leaders, and students to

- examine the value-added nature of educational experiences such as honors, learning communities, undergraduate research, or other programs designed to encourage and support higher-level learning;
- collect evidence of higher-level learning over time;
- adopt authentic, educative assessment strategies over simpler auditive assessment practices;
- engage in the benefits of mentoring and collaboration in the spirit of a genuine community of learners dedicated to the kind of excellence not limited to the measures of just more or accelerated work.

Because the portfolio, by definition, encourages the learner to gather information about learning from multiple sources, including critical reflection and self-assessment, it engages students in intellectually challenging, creative, rigorous work. It is both process and document, encouraging reflection, collaborative mentoring, and emphasis on documentation of learning through detailed outcomes. It is a powerful way of providing evidence of educational growth tied to students' reflections on the content, scope, and value of their learning. While portfolios provide teachers and administrators with diverse, multi-source information about learning for the purposes of assessment and evaluation, the final recipient of the learning portfolio's rich benefits in terms of inspiring and sustaining higher-level, deep learning is the student, an appropriate and precious achievement in higher education.

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CHAPTER NINE: PROMOTING CRITICAL THINKING THROUGH SEQUENCED ACTIVITIES

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Just as Miss America contestants routinely told Bert Parks they wished for world peace, faculty members, when asked about hopes for their courses, respond, "I want my students to learn to think critically." As Johnson (1995) notes, "It seems that critical thinking is on almost every educator's list of priorities" (p. 37). Faculty who teach academically gifted students feel particular pressures—and rightly so!—to maximize the learning experiences of high-ability students and the anticipated outcomes of their courses. Teaching for critical thinking is a lofty ambition, indeed, but the reality is that "research consistently shows that in practice we tend to aim at facts and concepts in the disciplines, at the lowest cognitive levels, rather than development of intellect or values" (Gardiner, 1994, pp. iv–v.)

Designing classes to promote critical thinking, however, is certainly possible and frequently practiced. Recognizing it when we see it has been complicated by the various disciplinary perspectives, but in practice most faculty who successfully challenge their students to think critically are engaging them in deliberately structured learning. Faculty often teach sequenced activities to strengthen student learning. Remembering that students respond to assignments with choices and with personal relevance, such faculty create motivating homework assignments to get students deeply involved with the course content. Fink (2003) notes that faculty typically focus too much of their class time on teaching content. With motivating homework assignments, students can focus on this content outside of class, freeing class time for problem-solving and critical-thinking activities that reinforce, rather than introduce, the content. These reinforcing activities motivate students to actively work together on academic tasks that build on the foundational homework. Walvoord (2004) calls such use of in-class time *process and response.* Fink (2003) concludes: "The key to getting students to do the necessary work and reading before class seems to lie in devising the right kind of in-class activities" (p. 167). The deep learning model provides research-based support for this approach.

The Research and Premises behind Deep Learning

Deep learning, which is a natural outcome of teaching for critical thinking, has recently received much attention. For example, the American Association of Colleges and Universities (2000) produced an oft-quoted monograph, *Greater Expectations: The Commitment to Quality as a Nation Goes to College*. Among other recommendations, it emphasizes that "shifting the focus . . . to learning proposes a college education centered on deep student learning and high levels of accomplishment" (p. iv).

Further reinforcement for deep learning comes from Bransford, Brown, and Cocking's (2000) groundbreaking report that looks at how people learn. Basing their conclusions on convergent research from a variety of fields, including cognitive psychology, developmental research, social psychology, neuroscience, and technology, the authors note that "one of the hallmarks of the new science of learning is its emphasis on learning with understanding" (p. 8).

According to Bransford, et al., three research-based findings have profound implications for how we structure learning with understanding: prior knowledge; deep, foundational knowledge based on concepts; and metacognition. Unless teachers know what students bring to the learning table (prior knowledge), they will be unable to help students build connections that help them organize facts within a conceptual frame (deep, foundational knowledge) that allows retrieval, application, synthesis, and evaluation, hallmarks of higher-order thinking under the Bloom (1956) model. Significantly, because metacognition has been, except for the early insights of Kurfiss (1988), a neglected area in higher education, more and more researchers such as Bransford, et al., are emphasizing the need for students to learn to think about their own thinking, including how they identify and monitor progress toward learning goals. The second finding in the study by Bransford, et al., coalesces perfectly with the international research on deep learning. To teach for understanding, not memorization, teachers must eschew breadth in coverage in favor of depth and critical-reasoning skills. Students need a deep, foundational knowledge, but the knowledge base needs to be organized around conceptual frameworks, not inert facts.

International research on deep learning has been ongoing in a number of countries including Britain, Sweden, Australia, and New Zealand. Four key components characterize a deep, rather than a surface, approach to learning, which Rhem (1995) summarizes: (1) a motivational context; (2) learner activity characterized not just by

doing, but by metacognitive reflection on what learners are doing, why they are doing it, and how well they are doing it; (3) interaction with others, particularly with peers; and, (4) a well-structured knowledge base connected with prior experience that allows for integration (p. 4). Such research strongly reinforces the need to think intentionally about how faculty structure and sequence assignments and activities to motivate students to prepare for class. Preparation is not enough: faculty must also reinforce learning through meaningful social learning exchanges with peers (the active learning/interactive heart of deep learning).

These preparatory out-of-class assignments cannot be viewed as a haze or busy work. Most students, even highly motivated ones, need some extrinsic reward for investing time in the homework. These rewards can be as simple as points awarded on a pass-fail basis; students completing, for example, a chapter summary at a specified level of proficiency receive five points counting toward a criterion-referenced grading scheme. In addition to giving credit for the homework assignment, the teacher must also use the assignment in class. Structured group work, or cooperative learning, is the easiest way to ensure the active learning and interactions needed for deep learning and for creating an educational climate that promotes higher-order, critical thinking (Millis & Cottell, 1998). Millis (2002), for instance, in support of the value of structured group work, specifically relates cooperative learning to the research on deep learning, with resultant critical thinking. More recently, Pascarella and Terrenzini (2005) determined that cooperative learning and small-group learning improved overall student learning by .51 standard deviations, evidence that should convince even the staunchest lecture-holics.

Using class time for active learning and interaction through group work or cooperative learning accomplishes many other objectives important to those teaching academically talented students:

1. Deliberately forming teams or pairs based on student heterogeneity sets the stage for critical thinking. Students may differ in obvious ways such as race, gender, ethnicity, or even socio-economic backgrounds, but academically gifted students will also vary in significant ways, such as problem-solving approaches, prior educational experiences, or other differences that may not appear on the surface. Brookfield (1987) and others have emphasized that critical thinking depends on identifying and challenging assumptions and subsequently exploring and conceptualizing alternatives. Such challenges will not occur when students all think alike.

2. Group heterogeneity also helps students build needed workforce and community skills by learning to value the contributions of others. Because self-confidence (sometimes labeled, appropriately or inappropriately, as "arrogance") can cling to the academically gifted, teachers who help these students see the value of cooperative behaviors can significantly impact their later success in a world where the Lone Ranger is no longer a viable model.
3. We must also build in processing activities so that students acquire not only team-work skills, but also the metacognitive skills advocated by Bransford, et al. Students need to analyze the impact on academic tasks of both the group dynamics—such as cooperation, collective strengths and weaknesses, and contributions—and their individual attitudes and contributions. Cuseo (1994) notes: "Such meta-cognitive processing involves student reflection on (a) individual steps involved in their thinking or problem-solving, (b) specific strategies or approaches they used in the process of reaching problem solutions, and, (c) underlying rationales for their ideas" (p. 73). [1]
4. Structured group work or active learning/interactions can also promote problem-solving at a higher level than would be possible with only individual effort involved. A meta-analysis by Springer, Stanne, & Donovan (1999) provides strong evidence that the use of small groups can result in greater academic achievement, more favorable attitudes, and increased persistence.

Bransford, et al., conclude: "The emerging science of learning underscores the importance of rethinking what is taught, how it is taught, and how learning is assessed" (p. 13). Teachers who understand this emerging science of learning, including the synergetic premises behind deep learning, cooperative learning, and critical thinking, are prepared to bring theory into practice.

Examples of Sequencing for Deep Learning

Two examples of sequencing assignments for deep learning, both of them using graphic organizers, are outlined in a recent publication by Millis (2005). She discusses using a Double Entry Journal (DEJ) so that students have five exposures to key course material. (See Figure 1 below.) Students complete the DEJ, set up in a table format, as homework, which is motivating because it involves their personal/academic responses to an author's key points. Students initially read the material, often an article, which offers their first exposure. They then return

Figure 1. Sample Double Entry Journal (Two Points Cited, Only)

Name: Barbara J. Millis

Article**:** "Investing in Creativity" by Robert Sternberg

Author's Critical Points	**Student's Response**
Creative thinking is every bit as malleable as critical thinking.	Judging from discussions at my own institution—and elsewhere—critical thinking is not as easy to define, let alone "teach" as some educators would have us believe. I happen to believe that critical thinking is taught by "doing" and doing things specifically within the discipline. Activities such as The Double Entry Journal encourage critical thinking.
The investment theory of creativity holds that creatively gifted people share common characteristics.	Do we find gifted people and look for these characteristics, or do we find the people who have these characteristics in common and then look for their creativity!?

to it to complete the DEJ. A third repetition occurs when students pair in class and read and comment on one another's DEJs (active learning/interaction). To engage students in the material a fourth and fifth time, the teacher comments on each student's DEJ and then uses either a composite version or selected DEJs as examples in class, presumably to prepare students for subsequent DEJ assignments. This repetition, using varied approaches to the material, capitalizes on what we know about human learning, which Leamnson (1999) characterizes as "stabilizing, through repeated use, certain appropriate and desirable synapses in the brain" (p. 5).

Millis (2005) discusses another practical example of sequencing material by using a *Cooperative Jigsaw* to promote deep learning in a literary studies class. Students form heterogeneous teams of four where each student focuses on a character in a work of literature; a well-known

example might be the characters in *Charlotte's Web.* As homework, all students are responsible for close textual reading that determines not only the four major traits for their assigned character (Wilbur, Fern, Charlotte, or Templeton) but also the textual evidence, including quotations or episodes that support those conclusions. In class, students form expert teams composed of all the students focused on the same character. They share their findings and then determine not only the most viable of the four traits, but also the best textual evidence to support those conclusions. Those familiar with the original Bloom's Taxonomy (1956) will recognize that these students are evaluating and synthesizing the material, Bloom's highest levels of thinking. During the final sequence in class, the students return to their original teams and teach their fellow students in their heterogeneous team the in-depth conclusions of their expert groups.

Jigsaw lends itself to virtually any discipline with complex problems that can be subdivided. Some examples might be the following: (a) Psychology or Child Development: the underpinnings of childhood moral development; (b) Botany: major plant groups; (c) History: segments of the Civil War; (d) Anthropology: various branches of the discipline; (e) Accounting: four methods of depreciation; (f) Chemistry: organic molecules that are polymers of carbon; (g) Engineering: designing a solar domestic hot water system; (h) Pharmacy: medication for seasonal allergies, common drugs from different classes used to treat diabetes, or four major methods of managing atrial fibrillation.

Assignments and activities for deep learning can be structured in numerous ways within disciplines, provided that the four critical elements of deep learning, cited by Rhem (1995), are present. Another example of deep learning follows.

An Example of Deep Learning: Cooperative Debates

In an English literature class studying *Antigone*, students form teams of four to five students to examine two key questions relevant to the play: "Pro/Con: Should Antigone have buried her brother?" and "Pro/Con: Should Creon be impeached for poor leadership?" Students draw slips of paper to determine their particular team. This random approach allows students to interact with a variety of classmates and ensures that the highest-achieving students do not self-select each other, thus skewing the debate results. As homework, each student reads the play closely and gathers support for his or her team's perspective, a motivating assignment directing students to explore the content. Students receive

class time to compare their notes and work on preparing the best possible arguments (active learning/interactions).

To avoid domination by the strongest students, the teams do not know in advance who their spokesperson will be until immediately before the debate. Thus, the teams are potentially only as strong as their weakest member, a situation that results in peer coaching and genuine learning. The spokespersons have a set amount of time, predicated on the length of the class period, to present their team's case. Each team then has class time to prepare a rebuttal. In the second round, the teams choose their own spokesperson. The half of the class assigned to the other debate topic observe this debate and vote to determine which side has made the most convincing arguments. The second pair of teams then follows the same procedure for their debate on the second question.

Almost all disciplines lend themselves to debate topics: (a) Computer science: Blackboard or WebCT course management platforms? (b) History: should the U.S. have dropped a second atomic bomb on Nagasaki? (c) Biology: to clone or not to clone? (d) Economics: should the U.S. adopt a flat-rate income tax?

Conclusion

Wiggins and McTighe (1998) emphasize the importance of "sequence in the design of the curriculum" (p. 134). They argue for a "spiral" curriculum where "the same ideas and materials are revisited in more and more complex ways to arrive at sophisticated judgments and products" (p. 135). Such approaches challenge academically gifted students to delve more deeply into material, to develop more sophisticated critical-thinking skills, and to cooperatively encourage their classmates to do the same. Honors at its best.

Endnote

[1]For more on the value of reflection and metacognition in deepening and extending student learning, see Zubizarreta's chapter on the learning portfolio in this volume.

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CHAPTER TEN: THE IMPORTANCE OF CLASS SIZE IN TEACHING AND LEARNING FOR HIGHER-LEVEL ACHIEVEMENT

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A quick browsing of brochures, handbooks, web sites, and other available information and marketing literature for honors programs and other opportunities designed for high-ability students across the United States and in other countries reveals that one of the most commonly touted advantages of such ventures is the prevalence of small classes. Advocates of honors programs, gifted education, and accelerated, enriched, or differentiated learning rally around the ubiquitous claim that class size is tied to more engaged teaching and enhanced learning opportunities, the kinds of special academic experiences that come from classroom environments that encourage and support closer relationships among students and between professors and students. Smaller classes, especially those taught by challenging, enthusiastic, skillful instructors, are essential to higher-level education because they allow for individualized, constructivist approaches such as active learning, collaborative/cooperative groups, problem- or inquiry-based pedagogy, experiential learning, discussion-centered curricula, and alternative assessment strategies.

Faculty and directors working with such programs believe in the power of small classes intuitively. We argue for the advantages of smaller enrollments in honors seminars and special sections of regular courses every semester when institutional pressures for efficiency weigh on us. We sell our programs in part, if not in large measure, on the virtues of small classes and the close intellectual mentoring made possible by fewer, more select numbers in our challenging courses. In other words, small classes are essential to the educational enterprise defined by honors, gifted, and other differentiated approaches to teaching and learning.

Aside from faculty, student, and sympathetic administrators' strongly intuitive conclusions and anecdotes that affirm the benefits of small advanced classes, what evidence exists that honors or exceptional students, in particular, learn more and more deeply in courses with limited

enrollment? In honors or other enriched courses—indeed, in higher education in general—is smaller necessarily better? Is less really more?

The Debate on Class Size

A review of major investigations and meta-analyses of the correlation between class size and student learning uncovers that even though the results of such inquiries are mixed, the research, according to Chism (1998), indicates that programs "that use immediate recall of factual information as the measure of success find large classes slightly more effective or at least equally effective" (online). Furthermore, Chism observes that programs of study that privilege "problem-solving, critical thinking, long-term retention, and attitude toward the discipline find small classes more successful" (online). In honors or comparable courses, the premium on the particular goals and outcomes mentioned by Chism suggests that the argument for smaller classes in such contexts can and should be made. After all, for example, even a cursory inspection of the numerous links to honors program web pages available on the National Collegiate Honors Council's web site (<http://www.nchchonors.org>) reveals that just about every honors program that holds membership in NCHC includes Chism's choice of words in its mission statement, list of educational aims, and course descriptions.

Where do we find data supporting the honors or higher-level program perspective on the importance of class size? Much of the research undergirding the argument for small classes has been focused for decades on K–12. The organization "Reduce Class Size Now," with connections to the National Education Association (NEA) and other agencies dedicated to primary education, illustrates the pervasiveness of the issue in media and on the internet. (See <http://www.reduceclasssizenow.org>.) While such sources look pointedly at the earliest years of school, some of the information is generalizable to higher education and some of the studies do mention the value of small classes in gifted programs and in college-level work.

A reasonable starting point in the deliberations is the landmark meta-analysis of Glass and Smith (1978, 1979), although Finn (1997) quips that the "debate about class size is not new" (online), traceable even further back than the Babylonian Talmud, fifteen to twenty centuries ago. As Finn implies, the longevity of the issue demonstrates the time-honored "desirability of limiting the number of students working with one teacher" (online). The Health and Education Research Operative Services (HEROS) web site (2003) offers an overview of the

class size debate in more modern times, citing, among others, the work of Howard Blake in the mid-1950s, which deduced that "small classes were better" (online). The HEROS site also refers to subsequent studies by Educational Research Services (ERS), whose findings were more mixed, showing "some support for the hypothesis that smaller classes are related to higher achievement" (online) but hedging with the caveat that the advantage is more prominent among certain students in selected elementary school disciplines. The HEROS summary of the ERS study adds that since Glass and Smith reported that the difference in achievement does not appear significant until class enrollments drop below twenty, with fifteen being the ideal number, reducing class size was not worth the financial implications. Such cautious positing characterizes the research on the subject, which has steadily been the source of many opposing views.

The work of Glass and Smith, however, added fuel to the controversy, launching a furious exchange on the topic, concluding unequivocally, according to Ellis (1984), that "a positive correlation can be drawn between smaller classes" and "student achievement, classroom processes, and teacher and student attitudes" (online). Detractors emerged almost immediately; for instance, Hess (1979) and Simpson (1980) countered Glass and Smith's findings with charges of biased data collection, statistical errors, and disregarded variables affecting the study. McIntyre and Marion (1989) added that research on class size is "contradictory and inconclusive" (online) and does not support the financial implications of reduced course enrollments. Financial implications, undoubtedly, appear as a constant concern in the discourse.

On the positive side, many studies have been published to support the thesis that smaller classes promote greater student achievement and faculty engagement. On the latter claim, in fact, a worthwhile outcome of many studies is that small classes, while surely benefiting students, actually have an even more affirming influence on teachers, whose morale and investment in pedagogical innovation increase, creating, in turn, a potentially better environment for learning. Finn (1997), Dillon and Kokkelenberg (2002), HEROS (2003), the irascible educational commentator Bracey (1995), and others do a good job of surveying the history of research literature on the issue of class size and underscoring the preponderance of evidence suggesting that small classes do make a difference in learning, achievement, and attitudes. All of them mention the massive STAR (Student/Teacher Achievement Ratio) Class Size project, a large-scale, comprehensive analysis conducted over several years in Tennessee. STAR resulted in a number of conclusions that have

grounded the plethora of arguments for small classes since the mid-1980s study. As Dillon and Kokkelenberg (2002) state, the project showed "clear evidence that smaller class sizes improve student performance" (p. 5), though they hint at some of the same limitations made explicit in Finn's (1997) report—most prominently that the greater gains were made by minority students and other disadvantaged populations of learners and that small classes are most beneficial in primary grades. Similar types of studies have been replicated in Canada, Australia, Britain, the United States, and elsewhere. In the U. S., at least "about half the states," according to Finn (1997), have implemented "small-class initiatives for some or all of their school districts" (online), involving sweeping legislation and huge budget allocations.

Class Size at the College and University Level

The confounding contradictions in the research about class size in the grade schools carry over into examinations of the issue in higher education. Among the voices expressing reservations, Williams, et al (1985) assert that data from a large project that observed student achievement in university classes ranging in enrollment from thirteen to over a thousand indicate that the importance of class numbers in college is overstated. In their ambitious, research-based study of how colleges affect student learning and overall development, Pascarella and Terenzini (1991) are also guarded in their view about the advantages of small classes. They emphasize a crucial theme that is elaborated later by McKeachie (1994): small classes, per se, do not necessarily result in better or deeper learning. The key is matching size to teaching practices that take the most advantage of the mentoring potential and opportunity for significant, active, higher-level learning inherent in the well-designed small-class context. Pascarella and Terenzini (1991) put the matter this way:

> Class size is not a particularly important factor when the goal of instruction is the acquisition of subject matter knowledge and academic skills. . . . It is probably the case, however, that smaller classes are somewhat more effective than larger ones when the goals of instruction are motivational, attitudinal, or higher-level cognitive processes. (p. 87)

The conclusions falling on the positive side of the class size debate in higher education are made more compelling by adding into the mix the crucial conversation about the influence of matching innovative, active, creative pedagogy to significant learning and higher-level

outcomes. (See Fink, 2003.) The twist is best articulated by McKeachie (1994):

> If one takes [the] more basic outcomes of retention, problem solving, and attitude differentiation as criteria of learning, the weight of the evidence favors small classes. . . . In general, large classes are simply not as effective as small classes for retention of knowledge, critical thinking, and attitude changes. (pp. 198–201)

When McKeachie adds that "meta-analyses of research on class size in classes ranging in level from elementary schools to universities . . . tend to support small classes" (1994, p. 198), he is not discounting the effectiveness of large classes within appropriate contexts. In fact, his point is that when the model of small classes is matched judiciously with particular groups of students and with teachers whose pedagogies synchronize with small-class course goals, assessment strategies, and outcomes, the result is the kind of powerful, deep learning that forms the core of enhanced honors- or higher-level curricula. In other words, writes McKeachie, "Size and method are almost inextricably intertwined" (1994, p. 197).

McKeachie's message is picked up by a number of other studies of class size at the college and university level. Chism (1998) says that "if information is dispensed by the teacher, class size does not matter" (online), but if discussion, application, and other active learning methodologies are prized, small is better. On the importance of participatory discussion as an anchor pedagogical strategy in successful small classes, McKeachie notes, "Because active thinking is so important to learning and retention of learning, constraints upon oral participation are likely not only to induce passivity but also to be educationally harmful" (p. 199). Chism has learned McKeachie's lesson well, advocating small classes when the methods used in those classes rely on discussion, problem solving, critical thinking, reflection, and writing—that is, the kinds of exercises that should predominate in courses designed to go beyond the normal pace and depth of standard, undifferentiated learning.

Measuring up to his own title, Follman (1994) studies the "conundrum of class size at the college level" (online), offering a number of contradictory explorations of the subject. Yet, he does reveal one significant conclusion within the history of competing studies: "Students in small classes of 15 or fewer did engage in greater use of the higher order thinking processes" (online), a reinforcement of lessons stated

above that substantiate the importance of small classes in achieving the goals and educational outcomes of enriched curricula and programming for higher-level learning. However, one cautionary remark in Follman's study bears mentioning: "Ancillary but perhaps more important findings were that talk in college classrooms seldom encouraged higher order thinking, and also that most discourse was conducted at the lowest cognitive level" (online). The comment, rather than taken as discouragement of the small class model, should be an incentive to teachers and students in stepped-up classes to work diligently and creatively to ensure the rigor, challenge, risk, and innovation of such courses. Again, size and method are intertwined, and one of the other themes emerging from supportive research on class size is that faculty development must be a key component in the design of small classes. Often, shifting from a large-class, lecture-hall model to a small-class, seminar model requires that faculty rethink teaching and learning philosophies, methodologies, materials, and assessment. Appropriate faculty development is essential.

One of the most thorough and critically astute reviews of the topic within the context of higher education has been written by Cuseo (2007). With a legion of seminal, empirical research data, Cuseo argues persuasively for the value of small classes in achieving deep, meaningful, lasting learning that springs from teaching strategies grounded in close mentoring, active-learning methodologies, sophisticated and generous discussion, reflective practice, ample feedback, and frequent writing practice. Cuseo synthesizes scores of research studies and outlines eight consequences of large classes—all negative—in order to underscore the critical value of small classes, especially in first-year courses, in achieving the sort of significant learning goals and outcomes that we typically expect in advanced, honors-level course work:

1. Large class size increases faculty reliance on the *lecture* method of instruction.
2. Large classes reduce students' level of *active involvement* in the learning process.
3. Large class size reduces the frequency and quality of instructor *interaction* with and *feedback* to students.
4. Large-class settings reduce students' *depth of thinking* inside the classroom.
5. Large class size limits the breadth and depth of *course objectives, course assignments*, and course-related learning *outside the classroom.*

6. Students' academic *achievement (learning)* and academic *performance (grades)* are lowered in courses with large class size.
7. Students report *less course satisfaction* in large-size classes.
8. Students give *lower overall ratings (evaluations)* for course instruction delivered in large classes. (pp. 2–9)

Ultimately, after carefully exploring much of the vast research available on each of the items on his list, Cuseo (2007) declares:

> Viewed collectively, the foregoing research findings and policy statements make a relatively strong case that 15 or fewer students represents an optimal class size. It may be that when class size becomes this small, a qualitative shift take [sic] place in the behavior of students and/or the instructor that can result in a sharp jump or spike in positive educational outcomes. (p. 12)

Light's (2001) examination of students' perceptions and experiences while pursuing a college degree also stresses the chief insights of McKeachie (1994); Cuseo (2007); Belenky, et al (1986); Brookfield (1987); Meyers (1986); Meyers and Jones (1993); and others who recognize the value of small classes in building strong, critically reflective learning communities and productive environments for greater achievement. Summarizing one of his major findings, Light (2001) notes, "Student after student brings up the importance of class size in his or her academic development. Not surprisingly, small-group tutorials, small seminars, and one-to-one supervision are, for many, their capstone experience" (p. 9). Later in his volume, Light adds that his extensive project "sends a clear message—that most of the time smaller is better, with stronger student engagement" (p. 45).

In Light's (2001) subsequent descriptions of what constitutes transformative small-class experiences, we notice, again, the implication that teaching methods that employ the tactics enumerated earlier—those that characterize the innovative, active, creative pedagogy possible in small classes—are essential to tapping the full potential of an intimate classroom. Reduced numbers alone do not create the magic reported by Light's student subjects. Implicit in their appreciative assessments of their rich learning is the students' acknowledgment of the wise choices, creativity, care, and pedagogical skill of an engaged, well-trained teacher in a small seminar or individual mentoring relationship. The "connected classroom" defined by Belenky, et al (pp. 214–29); the "reflective classroom" mentioned by Brookfield (p. 82) and Meyers (1986); the "silence" and active-learning environment envisioned by Meyers and Jones (pp. 30, 33–56)—all of these concepts are spaces for

applied, integrative, higher-order learning suitable for all students. But they are especially conducive to teaching highly motivated, talented learners, and they point directly or indirectly to the huge potential inherent in the small class, where the kinds of small-group learning referenced by such writers thrive more readily. Clearly, all of us who work with high-ability students in small-course settings should pay attention.

Small Classes, Evaluation of Teaching, and Grades

Another interesting feature of the literature on small classes is the correlation between results on student ratings and class size. Generally, course evaluation data drawn from student-rating forms show that students have a higher level of satisfaction when assessing their educational experience in small classes as compared to their ratings of large classes. Centra (1977, 2003), Feldman (1984), Seldin (1984), Cashin (1988), McKeachie (1994), and others agree, although we should acknowledge that most researchers caution that the association between high ratings and class size should not be overly emphasized in faculty evaluation. Seldin, for instance, says, "In general, slightly higher ratings are awarded to professors who teach courses that have fewer than fifteen students. . . . [But] it is only prudent . . . to avoid placing heavy weight on comparison of the ratings of professors teaching courses differing greatly in such characteristics" (p. 135). Cashin adds that "there is a tendency for smaller classes to receive higher ratings," but the assertion rests frankly on a "weak inverse association" (p. 3).

Centra (1977), on the other hand, factors into the research on evaluation of small classes the crucial dimension of learning. That is, he studies the degree to which student ratings correlate with actual student learning outcomes, contributing to what Cuseo (2007) calls

> a substantial body of research indicating that students' course evaluations correlate positively with actual *learning*—as measured by student performance on standardized final exams. . . . In other words, there is evidence that students tend to rate most highly those courses in which they learn the most. (pp. 9–10)

The contention seems well supported by Dillon and Kokkelenberg's (2002) study within the limited context of a single, large, highly selective institution. The authors examine the cumulative probability of grades and grade point averages received in over 360 thousand undergraduate samples from 1996–2001. Overwhelmingly, their data reveal that "the null hypothesis that class size does not matter can be rejected"

(p. 10). As class size increases beyond twenty, grade performance drops sharply until the size is forty, when results level off and decline more slowly all the way to beyond 400 in a class. As the investigators say, "Again, the message is that large classes have a high probability of lower grades than small classes," an ostensible causal relation that bodes particularly troubling for underrepresented, minority, at-risk, and women students, who generally perform worse as class size increases (p. 12). Considering the propensity of high-ability, honors-level students to thrive best in small-class settings that privilege the variety of active-learning approaches mentioned in earlier arguments, the news is just as bad for our brightest and most talented.

Of course, as the authentic assessment and learning-outcomes movement in education has taught us, grades do not *necessarily* correlate with learning, just as student ratings do not. In fact, Dillon and Kokkelenberg (2002) admit that despite their discovery of "a link between grades and class size," they hesitate to "conclude that students learn more in smaller classes," even though they do submit firmly that "class size has a negative relationship to grades" (pp. 14–15). But if we assume the best in our faculty and our students, perhaps higher grades—especially in honors-level or gifted or differentiated classes, where they are more common—are at least an indirect measure not of grade inflation but rather of actual learning. In one of the most detailed studies of the issue, Franklin, Theall, and Ludlow (1991) conclude that grade inflation is not the reason for higher grades in small classes; instead, perhaps genuine learning and appreciation for good teaching may be the answers. In scrutinizing evaluation results from over 13 thousand course sections over a six-year span at a large, urban, private university, the authors write:

> Class size emerged as the single most powerful predictor of grades and ratings for single-course sections, courses, and instructors. The relatively strong inverse correlations between class size and grades in each level of analysis may be the result of differences in grading standards, methods, or philosophy for small sections versus large sections; or a selection bias placing more experienced/higher-achieving students (and, hence, more satisfied) in small, elective, or upper level courses. Similarly, the pattern of inverse associations found between class size and overall instructor ratings at each level of analysis suggest [sic] that the student's lack of satisfaction with the instructor is matched by a lack of achievement in larger sections compared with smaller ones. (Franklin, Theall, and Ludlow, 1991, p. 4)

Hence, if we reframe the connection between high ratings and small classes as a sign of real learning and effective teaching, instead of bias, then Centra's (2003) comment makes good sense: "Small classes with fewer than 15 students get higher evaluations than do larger classes, but if students learn more in smaller classes because they allow for more personal attention, then class size is not truly biasing the evaluations" (p. 498). Cohen's (1981) robust evidence of the correlation between ratings and learning as demonstrated in common examinations across multiple sections of various classes is also convincing. In short, if we are willing to allow the possibility, if not probability, that good teaching results in deep, meaningful, lasting learning, then the results of such studies further corroborate the position that higher grades and higher evaluation feedback are a compelling part of a strong case for the importance of class size in promoting, supporting, and rewarding both effective teaching and enhanced learning.

A Dozen Tips for Significant Learning in Small Classes

The following brief suggestions take into account the results of many studies that have concluded that small classes generally foster greater learning, although we must always remember that the key to real success in the classroom is appropriate pedagogy aligned with the preparation level and learning preferences of students, expectations and outcomes of the course, class size, and many other important variables in a well-designed course for significant learning. The role of faculty development in helping teachers to design a powerful, productive learning environment in any size class cannot be emphasized enough. Versatile, responsive, engaged teachers can work wonders in small or large classes when they synchronize goals, methods, materials, assessment, and outcomes with size, level, and student-learning styles. Still, when we consider what we know about the learning preferences, intellectual potential, and work habits of honors or high-ability students in gifted, differentiated, higher-level programs in grade schools and higher education, matching a well-trained teacher with a small class of bright students yields a winning combination.

The research on the impact of class size on highly motivated, talented students leaves us with a compelling lesson. McKeachie (1994) cites several major studies that suggest that "the ablest students are most favorably affected by being taught in small classes" (pp. 198–201). Here is a modest list of best practices for teaching such students. Certainly, teachers in honors-level, gifted, or differentiated programs can add

more suggestions as they reflect on their own experiences and formulate a vision for how the small class can enrich their students' learning. Not surprisingly, all the tips are sound inspiration for improving all classes, but the smaller class makes the efforts qualitatively richer and more realistically achievable.

1. Keep class size to fifteen, if possible. Notice that the selected examples of the many research studies cited in this essay use fifteen as a consistent point of reference. If not feasible because of institutional constraints, employ small-group methodologies to provide students in larger classes with clustered learning experiences that help create embedded learning communities in the large setting. (See Millis, in this volume, for suggested group exercises.)
2. Take advantage of faculty development opportunities to sharpen pedagogical skills appropriate to teaching high-ability students.
3. Learn more about the learning preferences of bright, motivated students. Learning-styles inventories are a good starting point (for example, see <http://www.vark-learn.com>).
4. Design courses intentionally and strategically for significant learning (see Fink, 2003), which benefits all students but which especially resonates with highly capable learners. Designing for significant learning is challenging, requiring careful alignment of learning goals, methods or activities, feedback and assessment, and the situational factors of the course.
5. Place a premium on active-learning strategies that engage students in integration, application, reflection, and self-assessment.
6. Discussion—as McKeachie (1994), Brookfield and Preskill (1999), Light (2001), and others have shown—is the linchpin of the engaged, active, critically reflective classroom designed for higher-order thinking, learning, and retention of knowledge. Provide generous opportunities for productive, critical discussion that aims for reasoned analysis, synthesis, and evaluation; reflective judgment; and higher-level learning.
7. Incorporate writing. Light (2001, p. 58) emphasizes that writing is key to student engagement and learning. Encourage regular drafting, journaling, revisions, and peer-review.
8. Provide frequent, immediate, and judiciously selective feedback.
9. Empower students as collaborative learners; share the authority of knowledge with students; allow students to learn by teaching

themselves and by contributing to the goals, schedule, assignments, and assessment methods of the course.

10. Develop oral communication skills through several opportunities to present learning verbally.
11. Employ alternative assessment strategies to complement traditional methods of testing, papers, research reviews, and speeches. Find creative ways of allowing students to demonstrate their learning through diverse outcomes.
12. Do not forget the obvious but not-always-easy-to-do charge of the exceptional teacher: get to know your students well. Palmer (1998) writes, "Good teachers possess a capacity for connectedness. They are able to weave a complex web of connections among themselves, their subjects, and their students so that students can learn to weave a world for themselves" (p. 11). Knowing students' names, their ambitions, their fears, their triumphs, and their strengths and weaknesses establishes a connection that unlocks potential and eventual achievement. The small class is ideal ground for such growth and transformative relationships.

Small Classes for Higher-Level Achievement Are Worthwhile Investments

Earlier, we noted that financial considerations are often the block to widespread adoption of small classes as a model for richer, more active learning in all our institutions, small and large, private and public alike. But reorienting our thinking about the cost of small classes is a shift worth careful consideration. We should recognize that small classes have the short-term but considerable impact of providing both faculty and students the opportunities to take advantage of the benefits of collaboration, mentoring, active learning, and community building. Small classes also yield the long-term implications of helping our institutions to recruit talented, high-ability students and then offering them the kinds of specialized learning experiences that nurture their intellectual gifts and make them proud, loyal, and generous alumni. The question at hand is whether the availability of small classes, seminars, mentoring, small-group or individual experiences—the types of pedagogies and perks that generally distinguish honors, gifted, and other differentiated academic programs—are merely financial drains or are really investments in intellectual capital and alumni favor with both direct and indirect payoffs for individual faculty and students, institutions,

and society in general. The business analogy is anathema to educators, rightly so, but sometimes the economic argument is the one that wins the day with institutional leadership and external constituents.

Honors-level, high-achieving students in our colleges and universities have particular learning preferences, needs, styles, and potentials that a long history of research, mixed as it might be, suggests would be stimulated and more effectively fulfilled in the small class. Of course, other students thrive, too, in the qualitatively different classroom restricted to fewer numbers, depending on discipline, level, teacher, goals, methods, assessment, outcomes, and other variables that determine a course's ability to inspire and produce significant learning. Not every student wants or needs a small class environment. Not every course needs to be situated in a small class. Not every discipline requires small classes for all its offerings. Not every teacher is suited for or has the pedagogical skill to succeed in the small class. In fact, not every honors or gifted or differentiated course needs to be a small class. When the pieces all come together, however, size makes a difference, and our brightest students are among those best suited to tap the power of the small class.

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Part Four:

Exemplary Curricula for Significant Learning

What do the sun, the moon, and a deadly plague have in common? No, this is not a bad question from the analytical reasoning section of the GRE. Each topic is the nucleus for a course developed by a creative faculty member teaching in a program for high-ability, honors-level students.

Martin Brock shows that if the goal is conjuring a unifying topic for a broadly interdisciplinary course, the sun is hard to beat. **Ron Wilhelm** challenges non-science majors to analyze critically the bad "science" used in a television show to promote the idea that the Apollo moon landings were a hoax. **Tami Carmichael** addresses the phenomenon of plagues from many different perspectives and shows that the continuing threat of a pandemic, naturally occurring or spawned by terrorists, makes such issues even more relevant in the world today.

As we read the descriptions of these courses, we note how the authors have incorporated the hallmarks of effective liberal education into their teaching plan. To varying degrees and in different ways, students in each course engage in critical thinking and active learning, integrating disciplines and, over time, linking theory and application. The courses also make use of learning communities among other effective pedagogical techniques.

Charlie Slavin and **Chris Mares** view curricular issues at a higher level of integration. They describe a method through which faculty from different disciplines can effectively coordinate a four-course sequence on the vast topic of "Civilizations Past, Present and Future." To be successful, the enterprise requires of faculty the same intellectual flexibility to cross disciplinary boundaries as we expect from our students.

CHAPTER ELEVEN: USING SUN-SCIENCE TO EXPLORE CONNECTIONS BETWEEN SCIENCE AND THE HUMANITIES

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Overview

How can we humanize the sciences in a college curriculum? How can we better integrate science content with courses teaching the history of ideas? Is it possible to bring faculty from diverse disciplines together to make better sense of the context of science teaching within an honors program?

These and other questions framed a multi-year endeavor to create a science course for the Honors Program at Eastern Kentucky University. Over twenty faculty representing all the natural science departments and including English, history, philosophy and religion, and other disciplines engaged in grant-supported work with the paired goals of incorporating the development of scientific ideas into our non-science courses and placing specific science instruction into contexts familiar to students who have completed their other courses.

Briefly, our honors curriculum begins with a reading-intensive freshman rhetoric course followed by two semesters of the humanities, taught in a historic progression and closely aligned with a two-semester civilization course; both sequences focus heavily on Western European ideas and history. Students generally take the single-semester science course after they have completed the other courses. There are additional electives in the program, plus a senior thesis project. Since much of what we teach as science represents ideas spinning out of the same incubators as Greek thought, the renaissance, the enlightenment, and modernity, our faculty felt that an alignment among courses covering this same material would be appropriate. During the development period, we proposed several parallel science courses. Of these, only two have survived well in our curriculum: a course on evolution and our sun course, the topic of this paper. Other science courses have also been taught by faculty less familiar with our developmental process, including a course on water and one on symmetry in nature.

When we constructed our science course, we raised the question of what we mean by "science literacy." We wanted to ensure that the broadest scientific concepts would be covered, but how could we be very broad in a single semester without presenting just a shadow of the content? We wanted to connect with the history of ideas, but how could we find room in such a course for making such connections? In addition, each of us in the sciences is specialized in our disciplines, so an interdisciplinary approach would be difficult, and we knew of no adequate text to help us. We were also concerned that many students, particularly those outside the sciences, have problems connecting with science as they generally experience it, abstract and remote from their lives.

The question standing behind all others was the nature of scientific inquiry. The answer was rather discipline specific. Finding common disciplinary ground was difficult, but we agreed that scientific inquiry is the willingness to entertain new ideas, testable in agreed-upon arenas. Because the theme is common to disciplines outside the natural sciences, it gave us a conceptual framework for interdisciplinary cooperation in aligning courses with each other. The theme also provided a pedagogical framework, permitting students to debate alternate perspectives in class while still giving them the freedom to accept views distinct from their backgrounds. We felt that we could easily identify themes prevalent in science literacy that were somewhat broader than scientific inquiry. For those working on the project, science literacy refers to both a set of statements describing the world and the processes by which such statements have been validated. The statements include, in the physical sciences, descriptions of matter, energy, time and space, and ways in which forces act on matter. For the life sciences, they include issues of organization, energy flow, genetics, and evolution.

Science Content

We chose "The Sun" as the unifying idea for the class. The full title for the course is "The Sun: Earthly and Heavenly Reflections." While the class investigates the sun as an object, it also looks at its central role in provoking intellectual change, the sun as driver and provider for life on earth, the sun as metaphor and cultural reference, and the sun as emblem for the vastness of the cosmos. Using the sun as a backdrop, we recognize the presence of several main themes in the development of modern science. The Copernican Revolution, culminating with Newtonian mechanics and universal gravitation, is one unit of our class. We look at the science of life and how energy flow through biosystems

propagates change, complexity, and ultimately evolution. We have a unit on the earth's atmosphere and how it is influenced by both the sun and human activity. We also look at the sun itself, its history and its organizing influence on the solar system. Depending on exactly who is teaching the course, we may also add sections on fossil fuels and the roles solar energy sources may have in the future. Typical science topics covered in our course are listed in Table 1. Needless to say, none of these topics is covered at great depth. Each topic occupies roughly one class session.

Science and the Humanities in Our Course

Since one of the main issues within our science course has been to show science as a human endeavor, we incorporate interactions between historical science and competing trends in thought. We particularly use religious ideas as a point of reference to look at changes in scientific thinking. At several key points in the course, students look at contacts between religion and prevailing scientific worldviews. While ancient religion often centered on the sun, perhaps as a divine being, even Christianity's creation story and other scriptural writings were used in explanatory ways, parallel to or presaging the development of scientific explanations. In our explorations between science and religion, students see that sometimes scientific views dominate, and sometimes religion displays a moral superiority, and the relationship is not always antagonistic, as will be detailed below.

One motif that students investigate is the interface between science and religion. The intersections are summarized in Table 2 and discussed in more detail below.

On the first day of class, we conduct a multimedia presentation with readings from myths around the world. Simultaneously, we play a selection of music evoking the sun, including Duke Ellington's *Sultry Sunset, Cosmos* by Coltrane, *Total Eclipse* by Handel, *Sunrise* by Grofé, *Sun Treader* by Ruggles, and a number of others spanning many styles and generations, with a background video clip from *2001*, showing the sun rising over the monolith, one of the great mythic scenes in cinema. The readers are all decked out in academic gowns, as mythic storytellers, perhaps, reading in darkness by candlelight and with incense, suggesting that the course will bring students into the light and enhancing the sensory component of the experience. In the following lecture and in keeping with this affective approach to the sun, the students are asked to choose and role-play individuals for whom the sun represents a

meaningful component of their lives, people such as farmers or spring-break-obsessed students.

Table 1: Science Content in the Sun Course

I:	The sun itself
	Greek science and natural philosophy
	The Copernican Revolution
	Forces and motion
	Newton and gravity
	Math and science
	Energy and thermodynamics
	Spectra and using light to study matter
	Light as particles or waves
	Composition of the sun
	Models for solar system origins
	Complexity in planetary dynamics
	Physics of solar dynamics
II:	The history of the sun's impact on Earth
	Deep time
	Primordial chemistry
	Models for the origin of life
	Complexity and symbiosis in early life
	Changing atmosphere; life's responses
	Evolution; competition and cooperation
III:	The earth's atmosphere and the sun
	Weather and the climate
	Complexity, predictability of weather
	Ice ages and models for their causes
	Global warming; problems with ozone
	Geochemical cycles
IV:	Photosynthesis and the appropriation of the sun
	Energy transfer from the sun to us
	Thermodynamics and life
	Agriculture and human affairs
	Energy flow in biological systems
	Fossil fuels and solar energy
	Complexity and the environment

Table 2: Linkages between Science and the Humanities

Main Issue	Religious Framework
Perceived role of the sun in our lives	Myth as story with explanatory power
Heliocentric cosmos	Man as focus of creation implies geocentric cosmos
Clockwork universe implies determinism	Freedom vs. bondage—a central reformation debate
Evolution	Creationism
Environmentalism	Creation ethics

Galileo's dispute with Pope Urban VIII over the heliocentric universe is used to discuss the boundaries between religious and scientific discourse. Each had overstepped his case, particularly Galileo in ridiculing his friend and using arguments that were untenable even in their own times, such as the evidentiary nature of the tides. Their arguments were ultimately less about science and more about politics and religious authority. Subsequent physicists were as radical in proclaiming new science, but seldom were they persecuted by the church since the Protestant Reformation also had the church's attention and was a more serious threat. Students' familiarity with Galileo seems to be about how wrong the church was in the face of overwhelming data, yet the facts are kinder to religion.

One outcome of the Newtonian system was acceptance among scientists of a clockwork universe in which understanding all components would yield complete prediction of all future events. Such thinking implied a strong determinism and provided great evidence against freedom of the will, recalling the reformation debate between Luther and Erasmus. Can science resolve the issue once and for all? The church and science were not really antagonistic at that time, either. Evidence and reason were seen as helping resolve long-divisive issues of faith. Again, students are caught off-guard by not realizing how science could actually be supportive of a religious tenet. We challenge the students to examine the questions of choice and destiny in their own lives. The

issue is revisited later in the course when the tables are turned as modern analysis of complex systems suggests that the world may not be as deterministic as the Newtonians believed.

An obvious locus of antagonism between faith and science is evolution, and the course spends a small amount of time here. We spend little time on evolution *per se* since we have another course specializing in this topic, and it is not very closely connected to sun issues. One criticism of evolutionary theory, however, is the time factor: is there sufficient time in the age of the earth for evolution to have occurred? By modeling deep time linearly, as shown below, students develop better comprehension of the insignificantly small amount of time humanity has spent on earth. Some geological evidence for an old earth is presented, and much of the information seems to be unfamiliar to students.

The discussion of weather and other aspects of atmospheric chemistry leads to questions of environmental ethics. Here many scientists find themselves on the same side as many people of faith. Nearly all of the students initially see creation theology as anti-Darwinian and leading to stark contradictions with science. They are shown that contemporary ideas permit a broader understanding of creation theology in which they are called to respect a world abstractly created. The concept turns out to resonate well with many of them, allowing them to see science in a different light vis-a-vis religion. Students are shown that both aspects of our culture, science and religion, can depend on each other in an ongoing dialogue about ethics, in which science tends to push the limits of what can be done to improve our lives and religion asks whether such changes are appropriate. Students learn to recognize that religion and science have had meaningful and productive dialogue on topics such as the Bomb and uses of nuclear energy; genetic engineering of crops, animals, or people; biomedical research promising to help people, with its attendant high cost; and questions about access to technological innovations. Such discoveries surprise students who are convinced that science and religion are always warring camps.

Student Responsibility in Learning

In addition to exams and a few homework assignments, students have several fairly intensive activities in which they participate more directly with their learning experience. We ask them to undertake several group activities such as debates and panels. Working in small groups of 3–5 people, they develop both sides in a debate with the knowledge that they may be asked to defend either perspective at the

last moment. Recent topics for debates have included the roles of human activity in environmental change and resource allocation. A panel is a set of four students, each presenting a different perspective on some subject. Table 3 lists some panel topics used during the past several years.

How to Involve Students in Doing Science in a Lecture Course

The sun class is officially listed as a lecture course; however, because we believe that science is as much about process as content and because we are fully convinced that science pedagogy demands a fairly active role among students, we have inserted several active-learning events into this course. The activities take the place of traditional labs but are without the cookbook approach usually used. While data is sometimes gathered, more often the point is to challenge students' misconceptions about nature and to replace them with perspectives grounded on careful observation.

Each active-learning event consists of a team of students, usually 4–5, who are prepped beforehand to lead the rest of the class in the activity. Table 4 shows activities we used in one recent semester.

Although each activity is fairly simple, all require some level of classroom management and organization. In addition, students need to be aware of the central points for which they are looking, another important role for the leadership team. Careful observation is a critical skill in the class, and talking through each activity with the team enables students to see the essential points and helps them prepare the class for the activity itself. Each activity takes about half of a lecture period.

The modeling activities construct faithful linear models. For example, students' model of the solar system occupies several hundred meters, with the sun and planet diameters in proper proportion and perfect conjunction. On this scale, the earth is a paltry 1 mm in diameter; the sun, at 10 cm, is nearly 12 meters distant; Pluto is too far away to be included; and the nearest star is in northern Canada. Likewise, a linear model of time, using a long hallway to represent 4 billion years of earth's life, shows the sub-millimeter of recorded human history for the insignificance it is. Most familiar examples modeling time and space use logarithmic scales, greatly magnifying humanity and losing proportion. The students learn to feel awe that gravity, the weakest force in the universe, can still hold dispersed objects in its grasp and awe for the vast stretches of time used by evolution to work its course.

Table 3: Panel Topics

Solar and Other Renewable Energies as Replacement for Hydrocarbons
Global Warming
Prospects for Extraterrestrial Life
Religious Responses to Scientific Ideas
Determinism vs. Freedom in Nature
Overpopulation and Agricultural Practices
Biological Essentialism in Contemporary America

Table 4: Activities

Modeling Age of the Earth
Modeling Solar System
Photosynthesis
Newton's Laws
Complexity and Compound Pendulums
CO_2, Limestone, and the Carbon Cycle
Spectra

In addition to the modeling, some other activities involving the collection and interpretation of data are included in the course, and the student leaders have been especially useful in those procedures. Data used merely as numbers are insufficient as a pedagogical tool; better learning occurs when students see how the data are consistent with certain models of the world and inconsistent with others. The leaders, working as a team with clusters of students, help their peers to use data to overcome misconceptions such as relationships between force and motion or misunderstandings of the particulate nature of matter. While ultimately most of the statements we make about the world are data-driven, and only a few of these activities can be carried out in the allotted time, we hope that the students can make the connection that science is striving for consistent and robust models of the world.

And so . . .

In a three-semester-hour survey course in science, we have linked the principal components of science, using a largely historical progression of the development of ideas in order to correlate with parallel trends in the humanities, particularly the history of human ideas. The concept

would work better in a two-semester course, but various limits prevent that possibility. The course, as it stands, is a good model for most institutions to teach science to motivated students whether or not they have science backgrounds. Traditional science courses focus on detailed examinations of specific topics, and students lose track of the connections, making the larger picture of science incomprehensible. In addition, by looking at the contexts of science in socially relevant arenas such as environmentalism, resource allocation, and medical ethics, the course keeps students aware of and participants in the ways in which science can help shape public policy.[1]

Endnote

[1]The author wishes to thank Dr. Bruce MacLaren, Dr. Pat Calie, and Dr. Michael Foster, who have assisted in teaching the course, and Dr. Bonnie Gray, the director of our Honors Program, without whose constant support and encouragement our success would not have been possible.

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We have yet to encounter an adequate text for the course. Readings we have used include excerpts from the following sources:

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CHAPTER TWELVE: THE SCIENCE BEHIND THE MOON HOAX

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Introduction and Motivation

The goal of most introductory, non-major courses is to expose uninitiated students to a discipline for which they may not otherwise have a strong appreciation or interest. The aim can be realized through the dissemination of large quantities of knowledge that represent a broad sweep of information about the discipline or through the use of specialized research topics that allow students to conduct investigations in a mode of discovery similar to that used by professionals. Although the broad sweep approach exposes students to a vast sampling of knowledge, it is by necessity rooted in fact-based learning and is nearly devoid of the active discovery that inspires researchers in all fields. Alternately, a course based on specialized research topics can offer students an in-depth, active-learning environment, which, by necessity, must be narrower in scope. Research has shown, however, that active instructional environments that are learner centered, knowledge centered, and community centered are the most conducive to support learning (Bransford, Brown, & Cocking, 1999).

Which of the two approaches best initiates students to a discipline can be argued, and a decision depends in part on class size, student background knowledge, and the stated goals of the course. Within such constraints, an active-learning course offers students the chance to experience the discipline more fully and to gain a more systemic appreciation for an area of study. The demystification of what professionals actually do can lead to greater future interest while increasing students' confidence in their ability to interpret subject matter critically.

TTU Honors Integrated Science Laboratory

The Honors College at Texas Tech University offers several non-major, integrated science courses with laboratories. The courses are designed to expose students to various scientific disciplines and to the inter-connectedness across all fields of science. Team taught with Dr.

Ted Reid, the course that is the subject of this paper combined chemistry and genetics with physics and astronomy. In general, the students have a minimal science background or lack confidence in their own ability to do science. Students were surveyed the first day of class to find out how they felt about science in general. The majority (~ 75%) said they disliked science, offering various responses such as "I am science illiterate," "I am a right-hemisphere person," and "Science is nothing but a bunch of facts."

The physics/astronomy portion of the course was conducted during the second half of the fifteen-week term. The physics laboratory was designed to promote student investigation through research into a topic that was exciting and that contained meaningful physics principles. There were three primary goals for the lab:

- Allow students to discover that real science is about exploration and that facts are just the final outcome of doing science.
- Demystify science by empowering students with scientific self-confidence through student-generated investigations.
- Design a laboratory that is adaptable across the huge diversity of student background knowledge by allowing students to choose investigations that challenge them at their particular level of understanding.

The overlying theme of the laboratory was investigating claims made by the Fox Network's television special *Conspiracy Theory: Did We Land on the Moon?* (2001). The special presented interviews with advocates of the theory that the NASA-manned lunar landings had been faked to cover up NASA's inability to send humans to the moon. Throughout, the program presented scientific evidence that purported to prove the landings had been faked. The Integrated Science students watched the special and were asked to take notes on all physical claims presented by the proponents of the moon hoax theory. They then chose several arguments to investigate in detail. Their queries required them to design, conduct, and analyze their own experiment and reach a conclusion based on how well their data confirmed or contradicted the claim in the show. Students were also required to keep a journal throughout the course to document all developments in their investigation.

For the first three weeks, students participated in benchmark laboratories that explored the relationship between motion and time by investigating position, velocity, and acceleration, using sonic motion detectors and VideoPoint probeware. (VideoPoint is commercially available screen capture software that allows two-dimensional analysis

of digital video.) The benchmark investigations were open-ended labs that allowed students to devise their own methods for setting up the experiment, interpreting the data, and estimating uncertainty and error. These lessons not only gave students important background information for studying aspects of motion but also prepared them to design and conduct experiments for their research project.

The Moon Hoax Project

As mentioned previously, the first physics lab began by showing students *Conspiracy Theory: Did We Land on the Moon?* (2001), the Fox television special. This special made a forceful case that the manned lunar landings by the United States in the late 1960s and early 1970s were a hoax. The program backed up each argument with physical explanations that appeared to support the hoax. The special gave virtually no counterclaims to those of the hoax proponents. Although the program's narrator frequently told viewers to "weigh the evidence for themselves," the one-sided presentation style made this invitation a virtual impossibility for viewers who were uninitiated in the subject matter. An example is the claim that the astronauts were not on the moon because in every lunar photograph where the dark sky could be seen, no stars appeared in the photos. Lunar photographs were shown, revealing the absence, and viewers were told that the absence was contradictory to the fact that on the airless moon, stars can be seen even when the sun is in the sky. The assertion was, therefore, cited as evidence that the photographs were not taken on the moon.

Students were required to watch the video and take detailed notes about various claims made in the special. Afterward, students were asked to consider which of the contentions they would like to investigate and to consider how they might design an experiment to test each statement. The various claims, which are detailed in the following section, required the students to consider, investigate, and master physical principles of motion, optics, and geometric perspective. In other words, students had to weigh the evidence for themselves.

Before being shown the video, the students were asked the following survey questions:

- How many of you would say you are confident that we landed humans on the moon?
- How many of you would say that you are sceptical about the authenticity of the lunar landings?

When asked these questions prior to viewing the video, ~50% of the students said that they were confident that humans had gone to the moon. The rest of the class had no opinion on the matter. Most of the "no opinion" students said that they had never considered the question and knew very little about the moon landings. After watching the video, students responded to the same two questions with a very different outcome. Of the nineteen students who watched the video, seventeen expressed scepticism about the moon landings.

An introductory research activity initiated students into the project they were about to conduct. All students tested the first claim made in the hoax video by Bill Kaysing, which was that the film footage of astronauts on the moon was actually shot in a film studio on Earth. Part of the proof offered in the video was the absence of stars in any of the lunar photographs: "Kaysing observed that despite the clarity of deep space the stars were missing from the black lunar sky" (qtd. in Moffet, 2001).

To test the assertion, students were asked to go out on a clear night and take a picture of a group member with the stars in the background. We suggested that they locate in a lighted area so that a clear picture of the group member could be made and in an area where the sky had a clear backdrop of stars in the image. The following week most students arrived at lab with concerns. Despite following the instructions and getting clear photographs of group members, none of them could find stars in any of their pictures. The following excerpts from a student journal express the thought process that went on during the activity:

> *Student #1: Journal Comments Prior to Activity*
> I understand that by doing this we will somehow come to a conclusion about whether or not stars would be visible in the photographs from the Moon in 1969. What I don't understand is exactly how this is possible. The photographs would be taken from two different planets with two different atmospheres. How can what happens here on Earth be related to what would happen on the Moon?
>
> *Student #1: Journal Entry Posterior to Activity*
> When I developed my film I was surprised by the results of my experiment. The result was a clear picture of me with a black sky behind me. The similarity between what happened to [sic] with pictures of me and the pictures of the astronauts led me to think about what is actually happening inside the camera.

The student went on to discuss information about shutter speed, which she found at Kodak.com, and then added: "If you get a camera to take a picture of a bright object, dim objects won't be captured on the film. I think it is safe to deem this experiment a success. From the information we gathered, we were able to discount the claims of the Moon Hoax video."

Summary of Select Projects

Students spent the final four weeks of the lab, choosing two claims to investigate, designing experiments, conducting the experiments, analyzing the results, and writing a final report about their research. In the final week, each group presented the results of its investigations. We should note that early into their investigations several groups discovered the website *badastronomy.com*, which refutes the claims made in the Fox television special. After the discovery, all groups were informed about the website and the information aided several groups in the design of their experiments.

Below is a short summary of each of the student investigations:

Investigation #1—
Same Lunar Backdrop Used in Different Apollo Pictures

In the video, the moon hoax advocates showed images where the lunar module seemed to be present in one image with a mountain backdrop but absent in another image with the exact same backdrop. The observation led to the claim that "the same artificial backdrop was used when shooting two entirely separate pictures." Students travelled outside of town and took images of a nearby shed against a distant backdrop of a house and barns. One image was taken with the shed in front of the backdrop and the second with the shed behind the students and out of the frame of the picture. The result of this small change in position had virtually no effect on the backdrop positioning. Students reported, "The two backgrounds differ less than one millimetre [on the image], which is smaller than the human eye can normally detect without the aid of a measuring device." They concluded that the hoax claim was incorrect.

Investigation #2—
Intersecting Shadows on the Moon

The hoax advocates declared that multiple light sources were used in the Apollo photographs despite the NASA contention that the sun was the only light source available. The hoax advocates pointed out that

shadows cast in the photographs do not appear to run parallel, and, therefore, they argued that multiple light sources were used in a film studio. The contention led hoax advocate Bart Sibrel to say, "Outside in sunlight shadows always run parallel with one another. So the shadows will never intersect" (qtd. in Moffet, 2001).

Two separate groups investigated Sibrel's claim by taking images of shadows cast by the sun in the early evening. The students drew lines from the source and along the shadow that was cast. Each group experimented with various viewing angles, source sizes, distance to sources, and changes in shadow perspective when viewed from a point above the plane of the ground. One group concluded, "Our data shows [sic] that you can get unparallel shadows in pictures on Earth where there is obviously only one light source."

Likewise, the second group found that representing "a three-dimensional scene in a two-dimensional image causes distortion because of a perspective. . . . But from an above perspective and greater linear distance the shadows do indeed look parallel and converge upon the sun." Both groups' final conclusions were that shadows cast by the sun do run parallel but viewed on a 2-D plane do not necessarily appear to run parallel.

Investigation #3—
Astronauts Moving in Earth's Gravity

Another claim made in the video was that the astronauts were filmed walking in a studio on Earth and the film speed was cut in half in order to make the astronauts appear to be in the moon's gravity. In the lunar hoax video, hoax proponents doubled the speed of astronaut film footage and concluded, "When the speed of the film is doubled, the astronauts appear to be running as if in Earth's gravity."

One group of students analyzed the motion of actual Apollo film footage, using the screen capture software VideoPoint, in order to determine the astronauts' acceleration due to gravity. To accomplish the investigation, Quicktime movies of astronauts on the lunar surface were imported into VideoPoint, and the astronauts' motion was analyzed by marking the change in position from frame to frame on the screen. The students' analysis of various astronaut motions, including hopping and jumping, found a consistent acceleration due to gravity of 1.44 m/s^2. From basic gravitational equations, the group calculated that on the moon, the acceleration due to gravity should be 1.63 m/s^2, while the apparent acceleration caused by slowing Earth-based film to half the speed would give an acceleration of 2.45 m/s^2. Although the lunar acceleration from the movies (1.44 m/s^2) is marginally smaller than the actu-

al lunar acceleration, it is very different from the factor expected if filmed on Earth and slowed by a factor of two, as claimed by the hoax video. The students' conclusion about the acceleration was as follows: "This is 6.759 times less than that on earth, which is close to the 1/6 proportion that is expected. . . . Upon doing so, the evidence was close enough to convince us that the movie was not slowed by a factor of two."

Other Investigations

Along with the previously noted experiments, student groups also researched several other claims from the video. One group investigated the allegation that NASA photographs had been tampered with since some crosshairs, which were crosses etched into the camera lens, in the photos appear to be behind the object in the photos. Students showed that such a phenomenon occurs when a bright white object saturates the film, filling in the cross and making it disappear in the image. The result gives the appearance that the object is covering the crosshair. Another group investigated the hoax claim that a second light source was needed to illuminate objects in shadows, which should not be visible if blocked from sunlight. Contrarily, the group showed that backscattering of sunlight off of a powdery surface, like that on the moon, can illuminate objects in shadow. Finally, a group investigated the question of lack of dust on the lunar module. The declaration in the moon hoax video was that the exhaust from the lunar lander should have caused the fine lunar dust to be elevated and set back down on the lander, covering it in dust. One group of students used a vacuum pump to evacuate a large beaker with flour at the bottom. By giving small bursts of air and watching how the flour responded, they concluded that the vacuum on the moon prevents dust from billowing as it does in the air on Earth and likewise would prevent dust from settling on the lander after it has descended.

Conclusions

Students met the goals of the physics portion of the Integrated Science Lab successfully. They determined a question to study, constructed an experimental design, and reached a clear conclusion based on data from that design. Students also expressed surprise and satisfaction in their ability to test claims from a major network's TV show, using simple principles and designs: they were able to use science to evaluate dramatic claims made in the popular media.

Finally, students conducted meaningful experiments that were correlated to their particular level of background experience, removing

most of the adverse effects created by the huge disparity in background knowledge often associated with an introductory course. In this particular lab, students who felt more comfortable with mathematics and physics chose quantitative projects that required more conceptually difficult computations, while students who were less able to conduct such analyses were able to design and analyze experiments that were more visual, yet every bit as compelling. The variety of approaches allowed all students to gain self-confidence in their abilities to question and explore rationally the claims made in the hoax video.

In the year since first offering the course, we have modified our benchmark lessons to fit better the phenomena that are explored in students' investigations, giving students the tools to express results both qualitatively and quantitatively. The benchmark lessons ensure not only that all students learn physics but also that the lessons remain meaningful to the students since they have a direct impact on students' investigations.

In the survey at the end of the class, 100% of the students were highly sceptical of the claims made in the moon hoax video. Students also came away with a new appreciation for scientific research and the process of scientific discovery. The following is a final student journal entry:

> The Moon Hoax arguments of the movie were not solid because they were based on the wrong logic. They were logical for conditions on Earth but the Moon is a different story. However, the arguments are very misleading and I think people who do not take into consideration the different conditions on the Moon and Earth would buy into that. This . . . show[s] that critical thinking is crucial when analyzing the information that we are bombarded with every day. Without critically analyzing the information, people would believe in [false ideas]. By making us test an argument from the show, this class actually showed us how to approach any information—with skepticism.

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CHAPTER THIRTEEN: TEACHING DISEASE: UTILIZING INTERDISCIPLINARY SKILLS AND EXPERIENTIAL LEARNING IN AN HONORS CLASS

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More than any other course that I have designed or with which I have been involved, "The Coming Plague," an upper-division honors course that I have taught at the University of North Dakota several times during the past six years, has presented the vehicle for complete disciplinary integration, diverse classroom activities, and experiential learning. Over sixteen weeks, students explore the historical roots of disease alongside the development of cultural attitudes about disease, medicine, and death. In addition, they consider scientific advancements in combating disease and how those advancements may or may not be effective. In the wake of September 11, 2001, the course now considers more heavily public health crises and prevention strategies.

The course was actually the brainchild of a good friend and colleague of mine who left the university before she had the opportunity to develop and teach it. I inherited the course with some trepidation and much curiosity because the topic of disease and the question of its potential for reemerging as a national or global threat were issues that would easily and naturally lend themselves to interdisciplinary study, encompassing readings in history, epidemiology, psychology, sociology, politics, and literature. Interdisciplinary study is the hallmark of all honors courses taught in the University of North Dakota's Honors Program. Since learning never occurs in a vacuum, the study of any topic needs to occur in conjunction with the study of how that topic interrelates with other disciplines. Issues in science impact politics as well as social law and are often considered and criticized in literature, art, and film.

So it is with disease: disease is not just a medical or scientific issue. As science writer Arno Karlan (1995) has demonstrated, disease has been shaped by and has shaped human culture. Disease and death from disease have always gripped our imagination, and our feelings about

disease have been expressed in art works, poetry, short stories, novels, and films. Disease has also affected the laws and social structures of entire countries. As the Black Death swept across Europe in the fourteenth and then in the seventeenth century, social order fell to ruins, knowledge was lost, scientific and cultural advancements often all but ceased. After the Plague, those who survived lived in a world very different from that which existed prior to the disease's rapid spread. Doubts about God, about the church's effectiveness, about social hierarchies, and especially about medicine influenced policies, laws, and social mores.

Of course, such issues still affect people today. Thus, another factor that has made the course successful is that the topic of disease is always, unfortunately, timely. Despite the declaration in 1948 by Secretary of State George C. Marshall that "the conquest of all infectious diseases was imminent" (Garrett, 1994), disease has managed, as any good microbe should, to adapt and continue to plague us. The mechanisms of assault have often changed, but concerns over emerging and reemerging diseases have never been far from our minds. In the 1970s, we faced a potential Swine Flu epidemic and saw the emergence of hemorrhagic fevers in Africa, Germany, Asia, and the American southwest. In the early 1980s the AIDS pandemic gripped us with fear. In the 1990s, we remained concerned, and we talked about the mysterious Gulf War syndrome. Now, of course, we are all too aware of the threat and reality of bioterrorism.

Cultivating Interdisciplinary Learning

While all of these factors intrigue me as an academic and as a teacher, I have wondered why college students want to spend intensive hours every week thinking, talking, and writing about disease. The long waiting lists of students eager to enroll underscore the depth of the strange interest in this course, and for the past six years I have striven to understand the fascination disease holds for nineteen- and twenty-year-old students. I believe that an odd combination of both the perpetual human fascination with personal, inevitable demise, especially via some gruesome mechanism, and an objective, disconnected appeal to study the horrific are operating here. I liken such fascination to the almost uncontrollable need to rubberneck when passing a brutal car accident. Students' objective fascination highlights their disassociated approach to thinking about disease and illness. Alhough they know that they are mortal, they do not truly believe that they are personally

threatened by disease. As Enright, Shukla, and Lapsley (1980) suggest in their theory of adolescent egocentrism, students at this age see themselves as immune bystanders, not as inevitable participants in the world of disease. Since many of the students, though by no means all of them, who take the class are pre-med majors, the disassociation is troublesome because future doctors must work with patients who are victims of disease despite the fact that they themselves are so removed personally from the reality of disease and all of its implications.

Beyond capitalizing on the innate benefit of any interdisciplinary discussion that allows students to make connections between topics and disciplines, the main goal of the course has been, for me, to move students away from objective fascination and toward a better understanding of and empathy with those who are affected by disease. In addition, I want them to view disease in a broad context. Disease is not just an isolated occurrence, and it is not just a medical issue. Disease affects real people in a variety of ways that are unimaginable; in fact, increasingly and inevitably infectious disease will directly and significantly shape the individual lives of students in the class in their own lifetimes (Karlan, 1995). I want students to understand the course's message on a gut level, so that they can empathize with disease sufferers and so that they can, as adults, make informed, compassionate decisions about disease control, prevention, and treatment.

Students who enroll in "The Coming Plague" class come from a variety of backgrounds and majors; the common denominator is that they are all enrolled in UND's four-year honors program. The hallmarks of the program are interdisciplinarity in teaching and learning and the cultivation of critical thinking. Honors professors help students construct meaning through the distillation of personal inquiry, background experience, and outside information. An interdisciplinary approach to understanding disease, then, is optimal because in a tightly orchestrated, interdisciplinary course, materials are constructed to "entail a movement away from an absolutist conception of truth to a conception of truth that informs and is informed by the investigator's own sense of self-authorship" (Haynes, 2002, p. xiii).

Thus, the framework for an interdisciplinary approach was already in place; I did not have to tackle disciplinary biases because I constructed the curriculum. Therefore, I incorporated a thematic approach for studying disease and coupled it with a chronological methodology. Students begin the semester with Karlan's excellent book, *Man and Microbes* (1995), which examines the emergence of disease alongside the development of the human community. The book

also puts forth the thesis that "we are in one of those recurring eras of crisis when we accelerate the process of acquiring and adjusting to new pathogens. . . . If we are to adapt and survive, we must start by understanding how we have always coped with new diseases" (p. 11). The book offers students a broad overview of the various diseases that have affected humankind and of the way communities dealt with those diseases. From there, students shape questions about diseases and attitudes and, as a class, construct a framework for examining in detail some of the major diseases with which humans have dealt, including bubonic plague, leprosy, tuberculosis, influenza, Ebola, and HIV/AIDS.

Students create a chart of the social and medical responses to the disease and try to plot how and why various groups have reacted the way they did to disease. For instance, it becomes evident that despite knowledge to the contrary, the supernatural theory of disease, that it is a sign of God's punishments, has been quite popular over time and that distrust of the medical community has existed for centuries. Students also notice how xenophobia is linked to theories about disease and contagion, and they can examine laws and social practices that were formulated around the belief that particular foreign groups have or spread diseases.

To help students understand the diseases themselves, I invite biology professors and area doctors to lecture briefly on viruses and bacteria, explaining their structures and modes of transmission. In addition, students assume responsibility for a particular disease and research the disease from biological, medical, and historical perspectives, reporting their findings to the entire class.

Since the class is an upper-level honors class (300 level), students must take responsibility for shaping much of the class discussion and, often, even the journey we take as learners. My syllabus explains that I see myself as a guide and facilitator but that the discovery process that each student goes through will become part of the course itself, perhaps even changing the course's direction during the semester. For instance, initially plans may indicate spending considerable time thinking about bioterrorism and its history and implications. However, students may be interested in public health concerns that go beyond issues of bioterrorism. We will then shift our focus and develop methods for examining such concerns. Of course, such adjustments mean that I may need to spend time redeveloping assignments or even creating new ones and that new texts, usually in the form of articles from the libraries or internet, must be located and incorporated. The shifts are never a problem because I believe in recreating, not repeating, courses

so that they remain fresh for me, as well as for the students, and so that the classroom experience becomes a course with some pre-selected texts and activities, and waiting for the students to shape the rest is an exercise in trust and flexibility. Instructors must trust their ability as experienced teachers and academics to locate appropriate materials or spontaneously develop new assignments when needed. Concurrently, they must also have the patience to be flexible and give over what they think is highly important in favor of what interests students and brings them into the learning environment. Alongside providing ways to learn about the topic at hand, in this case disease, honors classes should also incorporate methods for encouraging students to take responsibility for their own learning, thereby helping them cultivate the desire and ability to be lifelong learners.

This approach, of course, does not mean that the students drive the classroom completely; indeed, we must remain or strive to be partners in the learning process. The main texts and some of the major assignments do stay in the course, although what we do with them or how long we spend with them may shift, and, ultimately, the goals I mentioned previously must be met. It is just a matter of allowing students to determine the side roads we take on our journey.

Interdisciplinary Assignments

Two of the assignments that are key to this journey and that require a great deal of interdisciplinary study are the Cooperative Learning Units (CLUs) and the Final Paper. In the CLUs, students are given certain parameters for research and are asked to become experts in one area that interests them. They bring their information back and present it to the class alongside the others. For instance, some CLU students have enjoyed focusing on the bubonic plague. Students sign up for individual pieces of research which, when examined together, allow for a broad, interdisciplinary look at the disease, its biological components, its history, and its treatment in art. Topics include the following: (1) "Find several poems, songs, or stories about the Black Death and bring them to share with the larger group. What themes do you find in common? What are the authors' attitudes toward life, death, and disease?" (2) "Visit the Medical School library and find three articles on bubonic plague. What research is currently being done on plague? What are current concerns about the disease?" (3) "What public policies and laws were changed or made as a result of any of the plague pandemics? Are any of these laws still in effect?"

Students complete several of these CLUs throughout the semester, and they have the option of choosing topics that interest them because of their backgrounds or fields of study, or they may choose a topic because they know nothing of the field and want to learn. During class discussion following their reports, we weave together the findings to discover how art, history, and medicine interface in relation to the topic at hand.

The final paper requires an interdisciplinary approach as well, drawing on personal learning gained through the role-playing activity, which is described below. In the final paper, students use some discovery or idea from the Disease Role-Playing activity as the seed for the paper in which they analyze critically some social, ethical, or philosophical aspect of disease. In one instance, a student who had been assigned the role of the first victim of disease in the role-playing activity (and thus he had to be separated from his family, and he eventually died and was buried) wrote a critical research paper on the ethical treatment of patients during disease outbreaks. He looked at public health concerns, various laws, the procedures outlined by the Centers for Disease Control and the World Health Organization, and various ethical arguments and philosophical writings on the rights of the individual victim. His conclusions were sophisticated, powerful, and stunning.

Some of the material in the course remains the same each year. For instance, beginning with an historical perspective is important because it provides a necessary overview and lays the groundwork for further integration. Times, like disease, however, change: course material must keep current with scientific updates and research on disease from various fields. Unlike when I first began teaching the course, the crises in public health policies and worldwide practices garner much attention. Now, any consideration of infectious disease would be impossible without looking at such issues, and, of course, the events of September 11, 2001, immediately changed our perspective on bioterrorism and potential pandemics.

Role-Playing in an Interdisciplinary Honors Class

Although many of the activities and assignments for the course encouraged student participation and interactive learning, they did not, I realized after several years, allow students to experience the full impact of the threats of disease. Additionally, the assignments themselves fostered competitiveness in the learning process, not cooperation, because they emphasized too much the role of the individual and not of the group.

Since the core of the class is integration and since dealing with disease in a real-world setting is both integrative and interdisciplinary, I had to develop a classroom experience that would help students feel the true impact of dealing with a disease outbreak and that would also encourage them to work in a cooperative manner to resolve a problem. Often college classes, particularly honors classes, rely heavily on assignments or projects "where each member does a piece and then the group merely assembles the pieces into a finished product" (Fuiks, 2000, p. 65). This type of assignment only "results in the group learning more about specialization and division of labor than developing [problem solving] and critical thinking skills" (Johnson & Johnson, 1992, p. 120). On the other hand, assignments that encourage true cooperative learning where group members work together to solve problems are "much more effective in achieving the types of learning and skills acquisition typically expected in an honors class" (Fuiks, 2000, p. 65).

To create this type of cooperative learning advocated by Johnson and Johnson, in my "Coming Plague" classroom, I implemented a role-playing activity in which students would, over the course of four weeks, deal with an epidemic by playing the roles of the people who could potentially be involved in an outbreak. They would have to work together, using their recently acquired knowledge of disease, to decide how to deal with the issues that would arise as the outbreak unfolds.

In the twelfth week of the semester, students receive an email message that tells them what role they have in the activity and with what scenario they are dealing. I decide which roles to create based on the actual people who would be involved in an outbreak within a community, and I set the outbreak in the Grand Forks, North Dakota, community where students are attending college. In this way, students visualize the happenings as they would actually affect their daily lives, and students can also gather information from local officials, doctors, and others regarding actual public health crisis policies. Some of the roles assigned include the following: victims, victims' families and close friends, doctors, nurses/health care workers, public health officials, University of North Dakota administrators, psychologists, City Council members, law enforcement officials, state government officials, Centers for Disease Control officials, mayor, governor, and local press.

All students are told that a patient recently appeared at a Grand Forks clinic with a particular set of symptoms. Each semester, I choose a different disease, so the symptoms differ each time. I give the immediate, most general symptoms that a person might display so that students can

see the difficulty of recognizing initially the onset of a deadly illness. As the semester proceeds, students, especially those playing doctors and other healthcare providers, must diagnose the disease before they can treat the victims and deal with the ramifications. One disease that works well is smallpox because it initially manifests vague general symptoms, is considered eradicated, and yet is at the center of concern as we discuss the most deadly diseases that could be used in bio-terrorist events. Anthrax also works well.

Students are not told who the victim is, but they are given specific information about their own roles and what their recent activities have been. They are also told what their initials steps need to be during the class session that begins our role playing. Included in the messages are both vital and non-vital information that they will have to navigate. Students have to think critically about the information, discuss it with others, double-check facts, and decide what information necessitates action. Following are two samples of the kind of information different students receive:

John:

> Hi! Since you are a high school guidance counselor here in Grand Forks, you have, over the past few weeks, been opening a lot of mail from colleges on the east coast. You notice that several of the catalogs from New Jersey and New York schools are covered in a fine white powder that you think is probably just dust. They have been sitting on your desk for several days, but you wash your hands after opening them because they coat your hands. You have also been on the east coast to attend some Senate hearings regarding education funding. You were picked to represent guidance counselors from the upper midwest. You spent three days in hearings and stayed four nights at the Watergate Hotel.
>
> On Saturday night, you, your wife (Kim), who is a local day-care worker as well as a member of the Grand Forks City Council, and her good friend Katie Tyler, a biology prof at UND, attended an international fiddling concert at the area events center. The next morning, you woke up with a headache, fever, and fatigue. You cancel plans to attend a family reunion in Fargo, but your wife goes by herself (you have no children). You stay home and watch football on the couch.

Monday, the headache is intense and the fever is much worse, so your wife insists that you see your family physician and long-time friend, Dr. Brian Thomson, at Altru.

When you come to class, you will talk with your doctor. Then after you leave from talking to the doctor (who might decide to hospitalize you, or might not), you begin to develop a rash of small pustules on your extremities. (Don't disclose this info until after talking with your wife and doctor).

Kim:

Hi! On Saturday night, you attended an international fiddling concert at the Alerus along with your husband, John (a guidance counselor at a local high school), and your best friend, Katie Tyler, a biology prof at UND. You had a great time at the concert though you all discussed your fears over recent world events and joked about the "dust" John found on the college catalogues recently received and about having attended Senate hearings in Washington regarding secondary education funding.

On Sunday morning, John woke up with a bad headache, fever, and fatigue. He attributed them to being overworked and begged to stay home and watch football instead of attending your family reunion in Fargo. You attend the family gathering by yourself.

On Monday, John's fever and headache are worse and you insist he see your family physician and long-time friend at the hospital, Dr. Thompson. You go to work as usual, at United Day Nurseries, where you are a day-care provider, and you make plans to attend the upcoming meeting of the City Council, of which you are an elected member.

During the next four weeks, students take the information they have, along with regular updates naming new victims and announcing deaths, and they must deal with the outbreak in the way the city would actually deal with it. In order to accomplish this task, they must discuss the situation with each other in a way that makes sense. For instance, in addition to figuring out how to treat the victims, the doctors must learn what the local hospital's procedures would be for handling a case of smallpox. They need to make decisions about whom to tell and when. The mayor needs to know the public health policies for the town and make decisions accordingly. The press needs to interview or try to interview the doctors, the mayor, members of the City Council,

and the victims' families. All decisions the students make have to be grounded in their reading or in the information they gather throughout the process. As the instructor, I make sure that I redirect any of the students' assumptions or conversations based purely on speculation toward the readings and facts that they have been studying.

By the end of the project, students must extrapolate their findings: will they have contained the outbreak, or will there be a pandemic? They will also analyze the situation and discuss what they have learned. Results have been stunning. After many weeks of reading about disease, suddenly they must deal with issues and details that they never considered. They are always shocked at their findings and particularly disturbed each time by how ill-prepared they find their community. In a way, like students who participate in City as Text™, students understand the socio-historical underpinnings of their community although their findings are more negative, focusing on the failures and potential failures of city planning.[1] Students have to talk with university officials, local government, and state health officials to discover what the community really would do in the event of an outbreak. What they have discovered is that the communication among entities who should be talking to each other is minimal and that no one in our area takes the threat as seriously as they should. Consistently and overwhelmingly, the students find that the community and state will not be able to handle a serious outbreak of any kind and that an event that might be dealt with locally will accelerate into a national disaster. They come away from the assignment shocked and discouraged by the public health system.

Despite the students' dismay, however, I am encouraged that honors students, who will eventually become doctors, government leaders, and community activists, are more immediately aware of the problems with their health system and with their community's dangerously casual attitude toward disease. I believe that our role-playing activity, more than any other assignment or activity I have used in the class, has allowed students to understand the complexity of disease, public health, and cultural biases. Having realized the gravity of the situation, they will be positioned to improve the systems and to cultivate a responsible approach to dealing with disease.

By combining a variety of interdisciplinary activities and readings and then linking these activities to experiential learning, students in our honors course on infectious disease have applied their acquired knowledge to a real-life situation; engaged in critical thinking about that situation based on their own experiences, opinions, and the distillation of gathered information; and responded to complex situations and ideas.

I believe that such experiences in honors classrooms allow students the autonomy to discover that true intellectuality is not about absolutes, as Klein (1996) would say, but about "tentativeness and reflexivity" (p. 214). Some students who leave the experience will eventually deal directly with human health issues and will shape public health policies; others will not, but they will inevitably struggle with the personal effects of disease in their lives. No matter what their future, students, I believe, have become more complex, nuanced thinkers and more aware participants in their own lives and in the lives of their communities.

Endnote

[1]For a more thorough discussion of experiential learning in City as Text™ methodology, see Braid's "Engagement in Learning, Liberal Education, and Honors" in this volume. See also Peter A. Machonis, ed. (2008), *Shatter the Glassy Stare: Implementing Experiential Learning in Higher Education* (Lincoln, NE: National Collegiate Honors Council).

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CHAPTER FOURTEEN: HONORS CURRICULUM DEVELOPMENT IN A REAL WORLD

CHARLIE SLAVIN AND CHRIS MARES
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Introduction

Curriculum development is and should be an organic process and should be driven by sound pedagogical principles. On the other hand, contextual realities of any particular course within a curriculum will greatly influence the possibilities and outcomes of any curriculum development. Naturally, the pedagogical principles will relate to the articulated goals of any particular course in terms of outcomes for students and should be defined as tangible activities students will be able to perform. An example might be as follows: "Students will be able to critique a poem in terms of an author's use of symbol and metaphor and make comments with regard to the time at which the poem was written and the time in which the student is living." The contextual realities, however, involve the history of any one curriculum within a particular setting, faculty and student involvement in the process of curriculum development, frequency of meetings of the curriculum development committee or equivalent body, and the role of the administrator leading the unit.

This chapter looks at the core sequence at the heart of the curriculum of the Honors College at the University of Maine-Orono as a case study illustrating this process and how the real world and pedagogical principles interact.

A Case Study

All students in the Honors College at the University of Maine-Orono must take *Civilizations: Past, Present, and Future*, a four-semester sequence. The following description on the Honors College web page is a summary of the course in terms of its scope as well as the various modes employed in the exploration:

> The four courses constituting *Civilizations: Past, Present, and Future* follow a chronological trajectory from earliest recorded times through the present, examining philosophy, history,

> literature, the arts, and natural, physical, and social sciences. In particular, by incorporating primary sources, small-group discussions, and multiple perspectives, these courses explore the way in which civilizations and cultures have been developed and have interacted with others.

The description does not overtly articulate learner outcomes although some would argue that the development of critical-thinking skills to a particular level of proficiency might reasonably be assumed. A more overriding goal involves development of the notion of critical engagement, a clear commitment to dialogue intelligently and openly with the lecturers, the preceptors, fellow students, and the texts, whether written or visual. More specifically, students are expected to develop their critical-thinking skills and are then expected to articulate their ideas both orally and in writing, presenting convincing arguments with appropriate references to justify their positions. Students must, however, take one more step and that, most importantly, is engaging in their own open and honest internal dialog. The dialog with self is central to any meaningful honors experience and requires a shift from the familiar high school preoccupation with book knowledge to one that includes self-knowledge and a willingness to develop new skills requiring both self-reflection and risk-taking.

Course Structure

Civilizations: Past, Present, and Future consists of four courses in which students explore primary textual materials along a chronological trajectory from Sumerian culture through our present global society. Through this journey, they investigate history, philosophy, theology, political theory, art, and the social, natural, and physical sciences. Each course involves a weekly general session in which a speaker or panel, typically members of the university faculty with experience in the current text or subject matter, addresses the entire class. Also, twice-weekly preceptorials that have fewer than 15 students are facilitated by a member of the honors faculty. The College seeks to populate the preceptorials with students from varied disciplines, and, of course, the preceptors bring their own disciplinary perspective to the discussions. Each course contains between twelve and twenty preceptorials and nearly as many preceptors.

The Texts

The texts forming the core curriculum of *Civilizations: Past, Present, and Future* were initially the core classics found in many Western Civilization courses. Over time, however, certain texts have been added and dropped and reintroduced, and the notion of text itself has expanded to include visual text. Reading visual text, such as The Acropolis or the stained glass windows of Chartres Cathedral, has also become a skill that could be isolated in the desired learning outcomes of a formal syllabus. Added to this was the inclusion of primary scientific texts covering the work of Copernicus, Darwin, and Einstein, to mention just a few, as well as texts from a broader canvas that included the Koran, Lao Tzu, Sappho, and DuBois. The latter selections were not in earlier iterations of the curriculum, and the ongoing experience of revision generally has molded and shaped the initial core curriculum. We have found safety in the received core and have used it to inspire and guide us whether through inclusion or exclusion. Our effort has been a text-driven approach and chronological in nature. This is not the only way to approach curriculum design, but it makes sense. Of course, some would prefer to use other principles, such as themes presented in modules, but the culture of our enterprise has led us to a town-meeting approach that requires all of the involved faculty both to develop the entire curriculum and to teach the texts that comprise it.

The Role of Faculty

The faculty of the Honors College is composed of faculty members holding positions in one of the degree-granting other colleges on campus and qualified adjuncts. No full-time honors faculty exist. Individuals become honors faculty by expressing interest to the Dean of the Honors College, who then consults with the Honors Council and, if appropriate, the home department/college of the faculty member. Faculty teaching *Civilizations: Past, Present, and Future* teach one or more preceptorials, depending on their interest and availability. The role of faculty is to act as preceptors twice a week for fifty minutes, to attend the course lectures, and to provide a syllabus for the section they teach, including information concerning faculty expectations, student attendance, participation, and assessment protocols. (There is a sequence-based *übersyllabus* that provides general information about all four courses, and the list of texts and lecturers for each course is provided centrally.) Faculty are expected, though not required, to be active

members of the curriculum committee, meeting for one or two days at the end of each academic year to discuss the previous iteration of the sequence and decide upon issues concerning the curriculum.

Naturally the faculty preceptor role allows for considerable leeway. In terms of curriculum development, the flexibility raises some interesting points. One opinion is that allowing for flexibility leads to variety and creativity. Both of these criteria, if addressed in a principled way, can only be an addition to any teaching environment. An opposing view might state that such leeway means that no standardization exists and that students studying the same material in the same course may be having very different educational experiences, some much more valuable than others. In a program such as that at the University of Maine-Orono, where faculty teach because they want to and are therefore interested and motivated to do so, the former argument prevails. When faculty do come to curriculum meetings and report on their classes in terms of how they teach, the sharing of ideas can lead to a naturally healthy environment for curriculum development where teachers experiment. Conversely, a more standardized model in which faculty are directed to teach in a particular way may lead to resentment and have a negative washback effect on the program.

Lecturers

The role of the lecturers is to provide informed comment on the core texts, although lecturers are free to choose how they accomplish the task. Ideally, given the nature of the course (100 and 200 level) and the breadth of material, the lecturers would contextualize the text historically; summarize the key arguments, ideas, or beliefs underpinning the texts; talk about the different ways the texts have been viewed; relate the texts to the present; and supplement such a process with a sense of their own position on the text. The question for curriculum development concerns the depth at which the texts are read and the need for supplementary material. Texts need to be appreciated and understood in terms of their significance, but students cannot be expected to be experts. At the same time, any superficial treatment of the materials would misrepresent their significance. Balancing these two issues is a perennial challenge, especially for lecturers who are specialists. Perhaps the best approach is to give lecturers a list of guidelines to take into account when preparing their lectures and then to hope they comply with them.

Preceptors

The role of the preceptors is to act as facilitators, not as disseminators of knowledge per se. Through guided questioning, preceptors can model critical-thinking skills, giving students the tools necessary to analyze new material. Preceptors come from various disciplines and departments across the campus and therefore almost always find themselves addressing issues outside their own disciplines. The experience at the University of Maine-Orono has shown such interdisciplinarity to be a positive model. In a case where preceptors are not any more familiar with a particular text than the students, their role is to act as co-learners. The model has been empowering for students, encouraging them to become critical thinkers and risk takers, willing to explore various ideas and possibilities before committing themselves to a position. In contrast to a solely knowledge-based curriculum, this approach focuses on the development of skills.

Preceptorials

The twice-weekly preceptorials ideally fall on either side of the lecture, enabling students and their preceptor to react to the text of any particular week, discuss its major themes, or respond to other issues. Following the lecture, students and their preceptor then relate their initial reactions and discussions to the lecture. The second meeting becomes a time to review and refine positions and then to summarize the text and prepare for the following week. In reality, preceptors follow various models. Indeed, both the disciplinary and pedagogical diversity of perspectives among the various preceptors involved in a particular course or the entire sequence is a strength of the model. Students are strongly encouraged, often in conflict with their inclinations, to sample the entire menu of possibilities during their four-semester journey through *Civilizations*.

The Students

In order for students to benefit most from the four-course cycle, they need to have an understanding of the goals of the course and the active role they are expected to take in it as learners. Students are liberated when they realize and understand that they are dialoging with the texts as individuals, with their own valid histories and perspectives as well as their own preconceived ideas and sometimes prejudices. Such involvement in the course is a requirement that is fully articulated in the curriculum.

Assessment

Faculty have been allowed some freedom in how students are assessed although the final exam has comprised a minimum percentage of the final grade. In most cases, faculty balance a number of factors, such as participation, weekly email responses to lectures, written papers, and the final exam. They have used various final examination models. Until recently, the final examination for each course has featured one or two in-class essay questions that ask students to draw on their discussions and analyses of several texts from the course. They are given a list of approximately six questions a week prior to the exam, but they do not know on which question(s) they will have to write until the exam itself since selection varies by preceptorial. In recent iterations of the sequence, faculty members have instituted an oral examination for the third semester and a take-home reflective response on the entire sequence for the final semester.

Conclusion

A sequence of courses such as *Civilizations: Past, Present, and Future*, like many similar courses in other institutions, is often the legacy of courses in Western Civilization, a well- established subject area with its own long history. A curriculum such as this can be seen as reactionary, a behemoth, but in our experience it is a body to work with and not against despite the admission that *Civilizations: Past, Present, and Future* had its genesis in a rather conventional and perhaps male and Eurocentric world view. Nevertheless, from this starting point, given active leadership and active faculty involvement, the sequence has developed into a far broader, multi-disciplinary course of inquiry.

The sequence has also yielded many lessons. Our experience with the *Civilizations* course has taught us that curriculum development is an organic process full of possibility and opportunity on the one hand and an endeavor fraught with danger on the other. Theoretically, for positive curriculum development to occur, certain conditions must apply:

1. The goals of the course must be transparent in terms of expected outcomes for students.
2. The roles of the lecturers, preceptors, and students must be made clear.
3. The function of the preceptorial model needs to be explained fully to both faculty and students.

4. The lectures must be related to the course as a whole in terms of its goals—for example, addressing the history of ideas or technological development.
5. Student input needs to be taken into account.

Given the scope of the texts, faculty must necessarily teach outside their disciplines and often outside their comfort zone. In this regard, they mentor and model for their students rather than act as conduits for knowledge. Some perform this role better than others and some are more comfortable with this than others, but the sense among students seems to be that the venture works. During a four-semester cycle, a student could experience four very different preceptors with very different views about the texts being taught and how they should be taught. In terms of educational experience, the variety is not a limitation but an opportunity, and in the end students have to come to their own conclusions about the material with which they are interacting. They experience different possibilities and different belief systems, and therefore they are compelled to find their own place.

Part Five:

Resources on Teaching and Learning

Academic institutions and professional organizations all around the world offer a myriad of resources for helping faculty and students improve teaching and learning. We suggest that among the many options available on most campuses, one of the most valuable is the faculty development center or program. The primary mission of most faculty development leaders is improving the quality, influence, and role of teaching in higher education in order to enhance student learning.

Another important source for innovative ideas and for models of excellence in teaching and learning is the honors program or college, where experimentation, creativity, and risk in pedagogy, curriculum development, and assessment are part of what happens on a daily basis to stimulate higher-level learning among academically talented students.

Obviously, other avenues for finding pockets of resources dedicated to teaching and learning on any campus exist, and the internet is certainly an increasingly useful tool. Here are a few suggestions of where to find practical tips on strengthening teaching and learning to help make our classes and programs true ground for outstanding instruction and enduring, meaningful learning.

Faculty Development Center Links

The following sites offer many useful resources on teaching, learning, and other facets of the professoriate. The links lead to select faculty development centers around the world, where information, tips, samples, theoretical frameworks, educational materials, and more are available. Admittedly, web sites change often, but the pages can be

found with a little perseverance by searching the respective institutions for faculty development or teaching and learning centers.

- Arizona State University <http://clte.asu.edu/teachingresources>
- Auburn University <http://www.auburn.edu/academic/other/biggio/resources.php>
- Brigham Young University <http://fc.byu.edu>
- Carnegie Mellon University <http://www.cmu.edu/teaching>
- Columbia College <http://www.columbiacollegesc.edu/faculty/dev/resources.asp>
- Eastern Kentucky University <http://www.tlc.eku.edu/tips>
- Georgia Southern University <http://academics.georgiasouthern.edu/cet/resources/resources_other.htm>
- Grand Valley State University, "Teaching Resources" <http://www.gvsu.edu/ftlc>
- Honolulu Community College <http://honolulu.hawaii.edu/intranet/committees/FacDevCom/guidebk/teachtip/teachtip.htm>
- Illinois State University <http://www.cat.ilstu.edu/az.php>
- Indiana University, Bloomington <http://teaching.iub.edu>
- Indiana University-Purdue University Indianapolis, "Download IDD Resources" <http://www.opd.iupui.edu/Units/IDD/index.asp>
- Kansas State University <http://www.k-state.edu/catl>
- McMaster University, Canada <http://www.mcmaster.ca/cll/resources/teaching.tips/index.htm>
- National University of Singapore <http://www.cdtl.nus.edu.sg/cdtlhome/faculty.htm>
- Northwestern University <http://teach.northwestern.edu/links.html>
- Ohio State University <http://ftad.osu.edu/Publications/TeachingHandbook>
- Oxford Brookes University, UK <http://www.uncg.edu/tlc/resources/teachingresources.html>
- Portland State University <http://www.pdx.edu/cae/teaching_learning_resources.html>
- Stanford University, "Speaking of Teaching" <http://ctl.stanford.edu/Newsletter>
- St. Olaf College <http://www.stolaf.edu/depts/cila/resources.htm>

- University of Adelaide, Australia <http://www.heacademy.ac.uk/474.htm>
- University of British Columbia, Canada <http://www.tag.ubc.ca/resources> and <http://www.tag.ubc.ca/links/topics.php>
- University of California, Berkeley <http://teaching.berkeley.edu/compendium> and <http://teaching.berkeley.edu/teaching.html>
- University College Dublin, Ireland <http://www.ucd.ie/teaching>
- University of Glasgow, Scotland, UK <http://www.gla.ac.uk/services/learningteaching/goodpracticeresources>
- University of Kentucky <http://www.uky.edu/TASC/ED/instr_resources.php>
- University of Manchester, UK <http://www.eps.manchester.ac.uk/tlc/resources/_index.htm> and <http://www.campus.manchester.ac.uk/ceebl/resources> on "Enquiry Based Learning"
- University of Michigan <http://www.crlt.umich.edu/tstrategies/teachings.html>
- University of Minnesota <http://www1.umn.edu/ohr/teachlearn/resources/index.html>
- University of Missouri <http://teachandlearn.missouri.edu/guide/chapters/index.htm>
- University of North Carolina, Greensboro <http://www.uncg.edu/tlc/resources/teachingresources.html>
- University of Oregon <http://tep.uoregon.edu/resources/index.html>
- University of Nevada, Las Vegas <http://tlc.unlv.edu/pedagogy/index.htm>
- University of Nevada, Reno <http://teaching.unr.edu/etp/teaching_tips/indexttips.html>
- University of Pittsburgh <http://www.pitt.edu/~ciddeweb/fds/lrn_list.htm>
- University of Queensland, Australia <http://www.tedi.uq.edu.au/teaching/index.html>
- Universiti Teknologi Malaysia <http://www.ctl.utm.my/teachingtips/ttlinks.htm>
- University of Virginia <http://trc.virginia.edu/Publications/Teaching_Concerns/TC_Topic.htm>

- University of Washington <http://depts.washington.edu/cidrweb/resources/topics.html>
- University of Wyoming <http://uwadmnweb.uwyo.edu/ctl/Teaching_Resources/index.asp>
- Vanderbilt University <http://www.vanderbilt.edu/cft/resources/teaching_resources/index.htm>
- Wabash College <http://www.wabashcenter.wabash.edu/resources/teach_web.aspx>
- Western Kentucky University <http://www.wku.edu/Dept/Support/AcadAffairs/CTL/db/teachingtools>

More Teaching and Learning Resources

The following sites, by no means exhausting the long list of possibilities, offer a rich compendium of global data bases and other online resources on teaching and learning:

- Australian Council for Educational Research, EdResearch Online <http://cunningham.acer.edu.au/dbtw-wpd/sample/edresearch.htm>
- Carnegie Foundation for the Advancement of Teaching, Knowledge Media Laboratory "KEEP Toolkit" <http://www.carnegiefoundation.org/programs/index.asp?key=38> and "Teaching Commons" <http://commons.carnegiefoundation.org>
- DeLiberations, UK <http://www.londonmet.ac.uk/deliberations>
- Faculty Development Associates <http://www.developfaculty.com/online/index.html>
- Higher Education Academy, UK <http://www.heacademy.ac.uk>
- Higher Education Outcomes Assessment, NC State University <http://www2.acs.ncsu.edu/UPA/assmt/resource.htm#course_assmt>
- IDEA Center, "IDEA Papers" <http://www.idea.ksu.edu/resources/index.html>
- Tomorrow's Professor, "Postings" <http://ctl.stanford.edu/Tomprof/index.shtml>

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Judith Ramaley has been President of Winona State University since July 2005. Prior to joining Winona State, she was Assistant Director of the Education and Human Resources Directorate of the National Science Foundation from 2001–2004. She has written extensively on institutional change, science, technology, engineering and mathematics (STEM) education, and civic engagement and social responsibility. She chaired the national Greater Expectations Panel that explored liberal education in a new era and has participated in a number of discussions about the nature of education in the 21st century. She currently serves on the Innovation America Task Force of the National Governors Association and is a member of the national board of Girl Scouts of the USA.

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Marca V. C. Wolfensberger is co-founder of the Plusnetwerk, a Dutch version of the National Collegiate Honors Council in the United States. She has published for the last five years about honours programmes and evoking excellence in scientific and professional journals. Wolfensberger lectures at and advises universities and organizations about honours programmes and fostering talent. She is co-founder and director of the Honours Progamme at the Department of Human Geography and Planning at Utrecht University, a research university in the Netherlands. The Honours Programme at Utrecht won the National Interstedelijk Studenten Overleg (ISO) Award in 2000, and the Dutch Ministry of Education specially recognized the programme in 2006. Wolfensberger is inspired by a love for learning and excellence.

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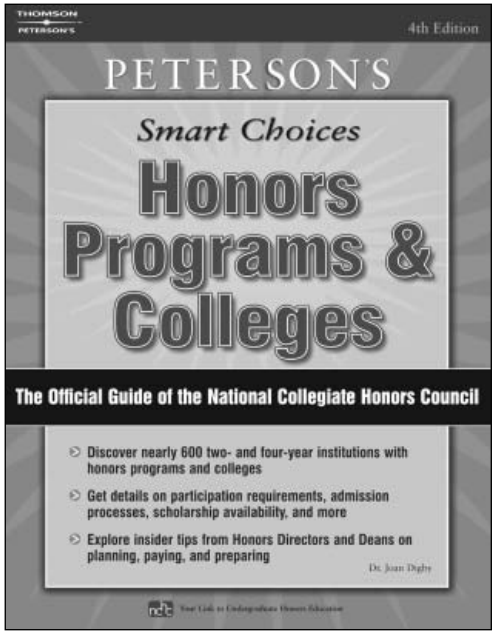
2nd ed.). Zubizarreta is currently President-Elect of the National Collegiate Honors Council (NCHC), and during his almost twenty years in honors, he has been a chair or member of several NCHC committees as well as a past president of the Southern Regional Honors Council (SRHC). When the academic life becomes too hectic, Zubizarreta is an avid telemark skier; an overly ambitious, aching runner; a former six-time national champion in whitewater canoe competition; a moonstruck husband; and the adoring father of two girls who keep him busy outside the ivied walls.



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Assessing and Evaluating Honors Programs and Honors Colleges: A Practical Handbook by Rosalie Otero and Robert Spurrier (2005, 98pp). This monograph includes an overview of assessment and evaluation practices and strategies. It explores the process for conducting self-studies and discusses the differences between using consultants and external reviewers. It provides a guide to conducting external reviews along with information about how to become an NCHC-Recommended Site Visitor. A dozen appendices provide examples of "best practices."

Beginning in Honors: A Handbook by Samuel Schuman (Fourth Edition, 2006, 80pp). Advice on starting a new honors program. Covers budgets, recruiting students and faculty, physical plant, administrative concerns, curriculum design, and descriptions of some model programs.

A Handbook for Honors Administrators by Ada Long (1995, 117pp). Everything an honors administrator needs to know, including a description of some models of honors administration.

A Handbook for Honors Programs at Two-Year Colleges by Theresa James (2006, 136pp). A useful handbook for two-year schools contemplating beginning or redesigning their honors program and for four-year schools doing likewise or wanting to increase awareness about two-year programs and articulation agreements. Contains extensive appendices about honors contracts and a comprehensive bibliography on honors education.

The Honors College Phenomenon edited by Peter C. Sederberg (2008, 172pp). This monograph examines the growth of honors colleges since 1990: historical and descriptive characterizations of the trend, alternative models that include determining whether becoming a college is appropriate, and stories of creation and recreation. Leaders whose institutions are contemplating or taking this step as well as those directing established colleges should find these essays valuable.

Honors Composition: Historical Perspectives and Contemporary Practices by Annmarie Guzy (2003, 182pp). Parallel historical developments in honors and composition studies; contemporary honors writing projects ranging from admission essays to theses as reported by over 300 NCHC members.

Honors Programs at Smaller Colleges by Samuel Schuman (Second Edition, 1999, 53pp). How to implement an honors program, with particular emphasis on colleges with fewer than 3000 students.

Inspiring Exemplary Teaching and Learning: Perspectives on Teaching Academically Talented College Students edited by Larry Clark and John Zubizarreta (2008, 216pp). This rich collection of essays offers valuable insights into innovative teaching and significant learning in the context of academically challenging classrooms and programs. The volume provides theoretical, descriptive, and practical resources, including models of effective instructional practices, examples of successful courses designed for enhanced learning, and a list of online links to teaching and learning centers and educational databases worldwide.

Place as Text: Approaches to Active Learning edited by Bernice Braid and Ada Long (2000, 104pp). Information and practical advice on the experiential pedagogies developed within NCHC during the past 25 years, using Honors Semesters and City as Text™ as models, along with suggestions for how to adapt these models to a variety of educational contexts.

Shatter the Glassy Stare: Implementing Experiential Learning in Higher Education edited by Peter A. Machonis (2008, 160pp). A companion piece to *Place as Text*, focusing on recent, innovative applications of City as Text™ teaching strategies. Chapters on campus as text, local neighborhoods, study abroad, science courses, writing exercises, and philosophical considerations, with practical materials for instituting this pedagogy.

Teaching and Learning in Honors edited by Cheryl L. Fuiks and Larry Clark (2000, 128pp). Presents a variety of perspectives on teaching and learning useful to anyone developing new or renovating established honors curricula.

Journal of the National Collegiate Honors Council (***JNCHC***) is a semi-annual periodical featuring scholarly articles on honors education. Articles may include analyses of trends in teaching methodology, articles on interdisciplinary efforts, discussions of problems common to honors programs, items on the national higher education agenda, and presentations of emergent issues relevant to honors education.

Honors in Practice (***HIP***) is an annual journal that accommodates the need and desire for articles about nuts-and-bolts practices by featuring practical and descriptive essays on topics such as successful honors courses, suggestions for out-of-class experiences, administrative issues, and other topics of interest to honors administrators, faculty, and students.