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A Human Capital Approach to Academic Advising

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Human capital, defined as any characteristic of a worker that contributes to that worker's productivity, is presented in this article as a unifying theme for academic advising in higher education. Five categories of human capital—formal education, adult education, on-the-job-training, health, and geographic mobility—and academic advising issues related to developing students' human capital in each category are presented. Students' vocational interests are identified with developing their human capital, and the principle of maximizing human capital is introduced as a basis for students' choices of academic curricula and particular courses and programs.

Many college students are busily preparing for the past, thinking that they are preparing for the future. Despite students' emphases on valuing a college education for its ability to prepare them for careers, students often make self-defeating choices of courses and programs. These self-defeating choices are the result of the world being in the midst of "... an information revolution that may very well parallel the Industrial Revolution in its impact and far-reaching consequences" (Gregorian, 1993). The emerging economy associated with the information society will operate on different principles than the industrial society that it is replacing. A worker in the industrial economy could receive training in one set of skills and expect to practice those skills throughout a lifetime. That assumption is no longer true. The average worker now changes careers four to six times in a lifetime (Rosenstock, 1991). In the industrial society, new technologies would eventually replace older ones, making particular skills and jobs obsolete. But evidence suggests that the obsolescence of skills will occur at an accelerated pace in the information society (Crawford, 1991; Filipczak, 1993; Johnston & Packer, 1987; Kaufman, 1994; Naisbitt, 1982; Rosenstock, 1991). Workers in the industrial society could complete a formal course of schooling and assume that their education was concluded. But the information society is ushering in an expectation of lifelong learning as a necessity for continuing effectiveness in the workplace (Naisbitt & Aberdene, 1985; Wiggenhorn, 1990). The industrial society was organized around

physical capital, with productivity and profitability being increased with investment in building factories, purchasing machinery, and upgrading technology. But the information society is focused on a different sort of capital—*human capital*—as the key to increasing productivity (Crawford, 1991; Johnston & Packer, 1987; Reich, 1993; Ritzer, 1993; Schultz, 1961; Thurow, 1980). It is this shift to human capital and the changing nature of acquiring and maintaining this capital that has not yet been understood by many college students. Academic advisors can play a critically important role in helping students to understand the changing nature of the economy and to choose courses and programs that will prepare them for a lifetime of success (Yarmolinsky, 1995).

Human capital is becoming an increasingly important tool for conceptualization of the role of education in the social and economic potential of the college student (Keynes, 1995; LaTourette, 1993). Business and civic leaders are speaking out more frequently on the issue of the poor preparation of high school and college graduates for entry into the workforce (Carnevale, Gainer, & Meltzer, 1990; Coates, Jarratt, & Mahaffie, 1990; National Center for Education Statistics, 1995). Colleges and universities are being asked by local and state government to supply so-called accountability data that often focus on the short-term employability of recent graduates. While traditionalists in postsecondary education will decry the increasingly vocational definition of a college education, they cannot deny that most students will need a base of skill and special knowledge to achieve their goals in the labor market (Sanders, 1992; Yarmolinsky, 1995).

The human capital concept as an organizing theme for academic advising is introduced and discussed. Outside of the need for helping students meet graduation requirements and build workable schedules, a developmental approach to academic advising is often used to help students make good course choices that fulfill their academic goals and take advantage of personal growth opportunities offered by cocurricular activities. An understanding of the human capital concept will help students assess the relative value of the curricular and cocurricular choices open to them and will provide

them with an operational principle of choice: the principle of maximizing their own human capital.

The Concept of Human Capital

In his presidential address to the American Economic Association in 1960, Nobel-prize winner Theodore Schultz introduced the topic of investment in human capital to the field of socio-economic development (Schultz, 1961). Many economists have argued that growth in human capital may be the most distinctive feature of the current economic system (Baumol & Blinder, 1985; Becker, 1975). Capital, conceptually defined as resources (such as factory machinery or inventories), has now been expanded to include the study of increased worker productivity through experience, training, and education—human capital. The term *human capital* refers to any characteristic of a worker (skills, special knowledge, health, or mobility) that helps make that worker productive.

The economy of the United States has undergone a fundamental transition from an industrial to a postindustrial economy in the second half of the 20th century (Bell, 1973), and the emphasis in a postindustrial society is on knowledge (Crawford, 1991). Therefore, corporations are transforming themselves to participate in a knowledge-based society, in part, by transforming the milieu in which their employees operate (Wiggenhorn, 1990). The creation of a knowledge society has led to an upgrade of many jobs in the labor market, especially those affected by the introduction of advanced technology such as computers (Johnston & Packer, 1987; Wiggenhorn, 1990; Wood, 1989). In the knowledge society, human capital has replaced dollar capital as the strategic resource (Naisbitt, 1982).

Human capital theory offers a valuable, unifying perspective in which to judge the value of students' choices made during the advising process and to insure the quality of the investment they are making in their educations. While colleges and universities have always valued learning for its intrinsic satisfactions, preparation for entry into the labor market is an important outcome of formal education. However, some students view the obtaining of a college degree as the only important outcome of the educational process. While it is true that the United States has become a *credential society* (Boyer, 1987; Collins, 1977), it is also true that employers have recently criticized the level of preparedness of many college graduates to succeed in the emerging postindustrial society (Meyerson & Zemsky, 1990; Weisberg, 1983). College students

can pursue and obtain a formal credential, and yet not develop their human capital to its fullest potential. Left to their own devices, students who have accepted the assumptions of credentialism often perceive their best (and particularly their short-term) interests as being served by following the path of least resistance to a college degree.

Academic advisors can use the human capital concept as a teaching tool to challenge the assumptions of a credentialist orientation, as a framework for student decision making in choosing a major program of study, and to select individual courses to complete graduation requirements. If students are serious about the goal of being well prepared to succeed in the job market, they should readily recognize that their goals can be operationalized as the process of maximizing their human capital.

The Five Types of Investment in Human Capital

The acquisition of skills in the emerging knowledge economy occur under special circumstances. The expression "investment in human capital" refers to any action taken to increase the productivity of a worker, such as formal education or on-the-job training (Schultz, 1961). Schultz (1961) identified five categories of investment in human capital; that is, five categories of personal qualities that add to a worker's human capital: formal education, adult education, on-the-job-training, health, and geographic mobility. While only the first category is formally related to academic advising in a post-secondary institution, each of the other categories represents issues that should be raised during advising meetings because they affect the outcome of formal education in increasing a student's human capital.

Formal Education

Human capital is created when people acquire *transferable skills* that can be applied in many settings and that can inform many different occupations (Harrington & Levinson, 1992; Pincus, 1980). Much of the human capital that is currently in demand relates directly to the outcomes of formal education (Kenny, 1993). One frequently cited study (Carnevale, Gainer, & Meltzer, 1988) asked employers to indicate the basic skills they believe to be important for prospective employees:

1. knowing how to learn.
2. reading, writing, and computation.
3. listening and oral communication.
4. creative thinking and problem solving.
5. self-esteem, goal setting and motivation, and

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- personal career development.
- 6. interpersonal skills, negotiation, and teamwork.
- 7. organizational effectiveness and leadership.

Knowing how to learn appears at the head of this list because employers know how quickly the base of necessary skills changes in the emerging economy of today. Kaufman (1994) suggests that the usefulness and marketability of special knowledge, practical skills, and targeted training for specific jobs be measured on the analogy of radioactive decay. Like radioactive isotopes, job training has a *half-life*: “. . . the amount of time it takes for half of the knowledge and skills acquired in a person’s formal education to become out of date” (p. 4). In the case of the field of engineering, the half-life of a bachelor’s degree in the 1980s was estimated to be about 5 years; by the end of the 1980s, the half-life for certain technical subfields was estimated to be as low as 2.5 years. Kaufman concludes that “. . . some of the technical knowledge and skills taught to college students today may be obsolete by the time they enter the work force” (1994, p. 4). Learning how to learn is a worker’s defense against obsolescence. To quote Naisbitt and Aburdene, “In a world that is constantly changing, there is no one subject or set of subjects that will serve you for the foreseeable future, let alone for the rest of your life. The most important skill to acquire is *learning how to learn*” (1985, p. 133, emphasis in original). Learning how to learn increases an employee’s human capital because it makes it likely that the employee’s experience can be transferred from one setting to another. An employee who understands the reasons for the actions being taken and knows the principles behind the success of a set of operations has a better chance of bringing valuable knowledge to a new task. Workers who know how to learn acquire job training with what economists refer to as a “steeper learning curve.”

An academic advisor can clarify the importance of the general education curriculum to the development of each student’s human capital. Many students—and many academic advisors—think of a general education requirement as an arcane rite of initiation or as a necessary evil to be concluded as quickly as possible. Indeed, many students have been caught up in the rhetoric of practicality, believing that only applied courses and curricula are relevant to success in the job market. But this belief is dangerously wrong in two important ways.

First, the rhetoric of practicality, especially its well-documented, anti-intellectual version, devel-

oped during a time of transition from an agricultural economy to an industrial economy. While the skills required in each economy were different, the economies were alike in the sense that one set of skills could be employed throughout an individual’s career.

The old American attitude that education could be completed once and for all and used over a lifetime is now an anachronism. “In the new information society where the only constant is change, we can no longer expect to get an education and be done with it. There is no one education, no one skill, that lasts a lifetime now. . . . Like it or not,” reported Naisbitt and Aburdene (1985), “the information society has turned all of us into lifelong learners . . .” (p. 141).

Second, since the workplace is changing so rapidly, the lingering belief that practical training is specific and narrow is now not only anachronistic, but downright dangerous to the futures of those who cling to it. As businessman Robert Naisbitt puts it, “We are moving from the specialist who is soon obsolete to the generalist who can adapt” (1982, p. 37). But further, the core skills of the postindustrial society are intellectual in character (Naisbitt, 1982; Naisbitt & Aburdene, 1985; Reich, 1993; Zuboff, 1992), and the most effective institution we have for developing these skills is formal education.

This conclusion has recently been supported by a study conducted by the National Center for Educational Statistics (1995) that surveyed 600 judges about the relative importance of written and oral communication, listening, and critical thinking skills. There was considerable consensus among respondents drawn from faculty, policy makers, and employers concerning essential skills for graduates who are successful in the workforce: these important skills are transferable because they can be learned in one context but applied in another. Skills such as awareness of a writer’s audience, writing to meet definite goals, prewriting preparation, organizing, drafting, and revising were all judged to be of value in practical writing activities. Reading, writing, and computation need not be taught in the context of business courses in order to be practical; the students who learn how to learn in traditional composition, literature, and mathematics courses can develop as much or more human capital than those students who take more vocationally oriented courses. Similar results were reported for public speaking and critical thinking skills. Students often resist enrolling in formal courses in these skill areas, convincing themselves that the content of such courses are not relevant to

their futures. Instead, they often complete required credits toward a degree with an assortment of “practical” electives that develop little in the way of human capital (Boyer, 1987).

Finally, students should recognize that even if colleges and universities had the budgets to provide state-of-the-art training for specific jobs in the labor market, the rapid pace of technological change would leave even the appropriately trained entry-level worker with what Rosenstock has called *throwaway skills*:

Even if vocational education were more successful at skill training and immediate job placement, focusing on the specific skills required by one occupation would not necessarily be in the long-term interests of students. We know now that the average American worker changes occupations four to six times in a lifetime. And given the speed of technological change, a focus on narrow training provides students with soon-to-be-obsolete skills. Throwaway skills for throwaway workers come at the expense of academic skills and problem-posing skills for the new workplace—an environment that requires self-learning. (Rosenstock, 1991; p. 434)

Students need to realize that their major is not their career, that general education is not a waste of time and energy, and that programs that provide narrow, practical training are not necessarily the best vehicle for developing human capital (Coleman, 1988; Davis, 1993). The academic advising relationship is a natural milieu in which to begin this reeducation.

Role of Academic Advisors. The following is meant as a suggestive, but not an exhaustive, list of issues that can be discussed in an advising relationship.

1. In addition to meeting graduation requirements in basic written and oral communication, students can be challenged to increase their human capital by taking additional course work. To supplement traditional composition courses, many colleges and universities have adopted the philosophy of *writing across the curriculum*, which has been singled out as an especially good vehicle for building written communication skills (Boyer, 1987; Naisbitt & Aburdene, 1985; Zinsser, 1988). Often a decision as simple as choosing writing-intensive courses over lecture courses (or even sections of the same course taught as writing-intensive experiences) can help increase students’ skills, and therefore, their human capital. Many English departments have developed additional composition courses

adapted to the types of writing common to business and industry (such as Technical Writing or Business Communication); when these are taken in addition to (but not in place of) traditional composition courses, they can add to a student’s human capital. Many departments of Speech or Communication have developed courses, in addition to general public speaking courses, that can improve oral communication. Dyadic Communication, Small Group Communication, and so forth, have the potential to develop a student’s oral skills in ways that promote the growth of human capital. Most curricula allow students some electives before graduation; a student can explore the possibility of selecting those electives with an eye to increasing his or her human capital.

2. More and more jobs require a substantial level of numeracy (Steen, 1990). Students can be encouraged to choose courses that increase their mathematical and computational abilities. For example, in addition to formal graduation requirements in mathematics, students could be encouraged to take a course in statistics.

3. Many students have an option of taking a foreign language as a part of their general education requirements, often as a part of the choice between qualifying for the B.A. or the B.S. degree. At West Chester University, students have a further option of replacing the second year of language instruction with an approved set of foreign language *culture cluster* courses. While students often make these decisions by trying to determine the path of least resistance, they need to understand that the choice to complete the traditional foreign language requirement allows them to claim a reading knowledge of that language. Thus, students who choose to complete this option increase their human capital significantly compared to the other students who merely complete a requirement for graduation. Other colleges and universities have been reforming their foreign language courses with goals such as encouraging cultural diversity and conversational fluency which hold great promise for developing human capital (Simone, 1993).

4. Most colleges and universities no longer require students to complete a formal academic minor. While a lack of minor requirement often increases the flexibility of students’ course options, it does little for human capital. However, many students can increase their human capital by choosing a formal minor in an area that provides skills or special knowledge that other graduates do not possess. Often a minor in an applied program such as business or technical writing, computer programming,

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public administration, or management, can complement a choice of a more traditional academic major by increasing a student's human capital.

5. The vocational orientation of the college student often makes them myopic; they think of the value of a college education as a means to find an entry-level position. The true value of a college education will only be realized if it prepares them to be successful over the course of their working lifetime. Many students avoid courses and experiences that cannot be shown to contribute to finding an entry-level position. A good academic advisor can challenge students to think more actively about their futures and encourage them to consider choosing courses that will be helpful as they advance within their fields. If they aspire to leadership, they can be led to think of courses that increase their interpersonal skills, their leadership abilities, and even their vision for the future itself. Sometimes electives are best used to round out the student as a person: to change attitudes, develop sensitivities, or inform their philosophies of life. Students without an intellectual reason for personal growth may be more receptive to rounding out their education when they realize that this growth also increases human capital.

Adult Education and On-the-Job Training

Much human capital is acquired on the job through experience. In many settings new workers are often inferior to those who have been working on the job for some period of time, because workers with experience often bring innovations to the process that cumulate into measurable gains in productivity. "The heart of the productivity problem," economist Lester Thurow stated, "lies in quickly advancing down the learning curve" (1980, p. 93). Pragmatic thinkers often assume that practical education provides the worker with knowledge about everything an employer expects. However, formal education is not training. "The labor market," Thurow argued, "is not primarily a market for allocating skills but a market for allocating training slots" (p. 56). Employers hire workers in hopes that their general education will turn into useful human capital as the worker is trained and then placed in the new job. Over time, the new workers with human capital will transform it with their accumulating working knowledge as well as transfer learning from previous work and educational settings. They will, in the language of economists, advance quickly along the learning curve and increase the productivity of the operation. Thus, corporations are "reinventing themselves into univer-

sities for lifelong learning" (Naisbitt & Aburdene, 1985, p. 3; see also Nopper, 1993).

Role of Academic Advisors. Even though college students have opted for a college education rather than matriculating into specialized institutions offering applied technical training, they often operate as if they were expecting a curriculum designed on the model of a vocational school. Academic advisors have an important role to play in making students aware that although they will probably require training beyond the completion of their baccalaureate degree in order to perform even entry-level jobs in many businesses and industries, they have made a better investment in their own futures by completing a college education rather than opting for more immediate, narrow, job-specific training. They also need to realize that employers seek and hire college graduates for entry-level positions, banking on the human capital of the new hires as a basis for their quick "advancing down the learning curve." Indeed, despite the consistent political discussion of training as a means of upgrading the skills of the unemployed, most training in the United States is offered to workers with college degrees, not to semi-skilled or unskilled workers (Hodson, Hooks, & Rieble, 1994). Finally, students need to realize that their human capital makes it possible for them to be more productive than other employees with the same training, offering them opportunities for advancement.

Health

If workers are healthy, they can exercise their human capital to its fullest extent. But poor health can limit a worker's productivity. While a student's health may not be the first priority of academic advisors, an advisor should make sure that students realize that many actions they take affect their health and their human capital. On the positive side, college campuses are increasingly well-equipped to promote wellness among students both in terms of offering up-to-date information through classes and cocurricular activities and in services such as fitness centers or student health centers. On the negative side, college campuses can be communities where students engage in risky behavior that threatens their long-term health.

One threat is drugs and alcohol. College campuses have seen a dramatic rise in the incidence of problem drinking and accidental injuries related to alcohol abuse (Gadaletto & Anderson, 1986; Gonzalez, 1993-94; Gonzalez & Broughton, 1993). Coming to college to increase one's human capital only to leave college with a dependency on alcohol

or a record of substance abuse is self-defeating. Likewise, sexually transmitted diseases and unwanted pregnancies are threats to long-term health, and therefore to human capital as well. While students often have considerable information about family planning and sexually transmitted diseases such as AIDS, they also report that such information often leads to little or no change in their actual sexual behavior (Butcher, Manning, & O'Neal, 1991; Sheehan, 1991). The same can be said of wellness as a whole. One 10-year study of the wellness practices of over 20,000 college students found that the majority of students did not report engaging in the highest levels of wellness activity (Jensen, et. al., 1992)

Role of Academic Advisors. Too often colleges have fallen into a bureaucratic division of labor where health matters are left to student affairs programs while educational decisions are seen as the exclusive concern of academic advisors. It would strengthen the message of both student affairs professionals and academic advisors if they spoke to students with one integrated voice about the importance of students taking care of their health (Gonzalez, 1993–94; Sheehan, 1991).

Geographic Mobility

During any economic period, but especially in times of economic transition, the localities where old jobs are lost will not often be the same as those where new jobs are created. Thus, workers who are willing and able to relocate have more opportunity to use their human capital than workers who cannot or will not move. Students should be encouraged to think about the role of geographic mobility as a part of their decision-making process, because students often make self-defeating academic choices when the role of geographic mobility is not considered.

First, the geographic distribution of demand for any particular skill is highly unlikely to be uniform (Johnston & Packer, 1987; Schultz, 1961), and if students choose a course of study leading to skills that are in low demand in the locale where they plan to live, their choices are often self-defeating. Second, the willingness to be geographically mobile may, by itself, be a desirable quality to prospective employers. Students who seek the stimulation of exploring new areas and meeting new people can thrive in such circumstances. Applicants to such organizations should always make these interests known to prospective employers because these interests will be weighed positively by those in charge of hiring decisions. Third, workers in

large organizations, and especially multinational corporations, are commonly required to relocate to take a promotion within the organization. One of the ironies of the emerging economy is that getting a dream job may turn into a nightmare when a worker is faced with the dilemma of moving to accept promotion or turning down a promotion—and running the risk of eventually being passed over for promotion—to preserve the stability of family or established lifestyle which is rooted in one particular locale.

Role of Academic Advisors. Students often unwittingly play the game of life assuming that their choice of vocation and their choice of residence are independent of one another. This is not true, and advisors can help students define the degree of social mobility they have or want, as they are making the academic decisions that help determine their human capital.

The Principle of Maximizing Human Capital

The picture that emerges from reading the literature on the demands of the postindustrial economy is that workers with the best economic prospects are going to be workers who have developed maximum human capital. These workers have boosted their human capital by acquiring strong skills in literacy and numeracy, entering the core labor market on the basis of those skills, and then profiting from specific on-the-job training (Hodson, Hooks, & Rieble, 1994). The firms that recruit workers from the core labor market will make sizable investments in on-the-job training to maintain the skill level of their workers, but firms that recruit from the peripheral labor market will display little inclination to provide on-the-job training, except for training in standardized, unskilled positions (Hodson, Hooks, & Rieble, 1994; Johnston & Packer, 1987; Pincus, 1980). The latter category of firms will continue to minimize training costs either by insisting on credentials based upon narrow, highly specialized courses (or programs offered by adult education or vocational education institutions). It will increasingly fall to academic advisors to clarify for college students the value of human capital, the limits of credentials—even the college degree—as a basis for economic success, and the strategies they can employ to maximize their human capital.

Good academic advising shares many of the same qualities as good teaching (Ryan, 1992), including actively involving students in identifying their interests, skills, and life goals (Ediger, 1992). One approach to offering good academic advising

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is to acquaint students with the concept of human capital and to offer students the principle of maximizing human capital as an explicit criterion for selecting majors and minors, courses, and even particular course sections. The appropriate question for students to ask of each choice is, "What does this choice contribute to the building of my human capital?" Students should realize that every choice has consequences for human capital, and be aware of these consequences in making those choices. Choosing a science course with a laboratory over a survey course with no laboratory can increase a student's human capital. Choosing one section of a course that is writing-intensive over one that uses only objective testing can increase a student's human capital. Choosing an elective that offers a skill or specialized body of knowledge over an elective that offers only an interesting topic can increase a student's human capital. This principle should not be slavishly applied, but it is one useful criterion to keep in mind when making the dozens of decisions that chart the course of a student's progress toward a baccalaureate degree. Each time the principle of maximizing human capital is considered, students are actively engaged in considering their futures and the preparatory role of their current educational activities. Such consideration is at the heart of the developmental model of academic advising.

References

- Baumol, W. J. & Blinder, A. S. (1985). *Economics: Principles and policy* (3rd ed.). San Diego: Harcourt Brace Jovanovich.
- Becker, G. S. (1975). *Human capital* (2nd ed.). New York: National Bureau of Economic Research.
- Bell, D. (1973). *The coming of the post-industrial society*. New York: Basic Books.
- Boyer, E. L. (1987). *College*. New York: Harper & Row.
- Butcher, A. H., Manning, D. T., & O'Neal, E. C. (1991). HIV-related sexual behaviors of college students. *Journal of American College Health*, 40, 115–118.
- Carnevale, A. P., Gainer, L. I., & Meltzer, A. S. (1988). *Workplace basics: The skills employers want*. Washington, DC: U. S. Department of Labor and the American Society for Training and Development.
- Coates, J. F., Jarrett, J., & Mahaffie, J. B. (1990). *Future work, seven critical forces shaping work and the workforce in North America*. San Francisco: Jossey-Bass.
- Coleman, J. S. (1988). Social capital in the creation of human capital. *American Journal of Sociology*, 94(Supplement), S95–S120.
- Collins, R. (1977). Some comparative principles of educational stratification. *Harvard Educational Review*, 47(1), 1–27.
- Crawford, R. (1991). *In the era of human capital*. New York: Harper Business.
- Davis, L. J. (1993). Equating training to education. *The Journal of Continuing Higher Education*, 41(1), 34–38.
- Ediger, M. (1992) Professors as student advisors. *College Student Journal*, 26, 365–367.
- Filipczak, B. (1993). High skills under the hood. *Training*, 30(4), 43–47.
- Gadaletto, A. & Anderson, D. (1986). Continued Progress: The 1979, 1982, and 1985 college alcohol surveys. *Journal of College Student Personnel*, 27, 499–509.
- Gonzalez, G. (1993–4). Can colleges reduce student drinking? *Planning for Higher Education*, 22, 14–21.
- Gonzalez, G. & Broughton, E. (1993) Changes in college student drinking, 1981–1991. *Journal of College Student Development*, 34, 222–223.
- Gregorian, V. (1993). Education and our divided knowledge. *Proceedings of the American Philosophical Society*, 137(4), 605–611.
- Harrington, M. & Levinson, M. (1992). The perils of a dual economy. In H. F. Lena, W. B. Helmreich, & W. McCord (Eds.). *Contemporary issues in society* (pp. 334–342). New York: McGraw-Hill.
- Hodson, R., Hooks, G., & Rieble, S. (1994). Training in the workplace. *Sociological Perspectives*, 37(1), 97–118.
- Jensen, et. al. (1992) Relationship of health behaviors to alcohol and cigarette use by college students. *Journal of College Student Development*, 33, 163–170.
- Johnston, W. B. & Packer, A. E. (1987). *Workforce 2000: Work and workers for the twenty-first century*. Indianapolis, IN: Hudson Institute.
- Kaufman, H. G. (1994). Obsolescence and retraining of technical professionals: A research perspective. *The Journal of Continuing Higher Education*, 42(2), 2–11.
- Kenny, S. S. (1993). Using business leaders for academic planning. *Planning for Higher Education*, 21, 21–26.
- Keynes, J. M. (1995) Are students borrowing too much? *Planning for Higher Education*, 23, 35–42.
- LaTourette, J. (1993) Does higher education pay off?

- Planning for Higher Education*, 22, 48–51.
- Meyerson, M. & Zemesky, R. M. (1990). Editorial. *Daedalus*, 119(2), 232.
- Naisbitt, J. (1982). *Megatrends: Ten new directions transforming our lives*. New York: Warner Books.
- Naisbitt, J. & Aburdene, P. (1985). *Re-inventing the corporation*. New York: Warner Books.
- National Center for Education Statistics. (1995). *National assessment of college student learning: Identifying college graduates' essential skills in writing, speech and listening, and critical thinking* (NCES 95—001). Washington, DC: U.S. Department of Education.
- Nopper, N. S. (1993). Reinventing the factory with lifelong learning. *Training*, 30(5), 55–58.
- Pincus, F. L. (1980). The false promises of community colleges: Class conflict and vocational education. *Harvard Educational Review*, 50(3), 332–361.
- Reich, R. B. (1993). The REAL economy. In W. D. Perdue (Ed.), *Systemic crisis: Problems in society, politics, and world order* (pp. 107–120). Fort Worth, TX: Harcourt Brace Jovanovich College Publishers.
- Ritzer, G. (1993). *The McDonaldization of society*. Thousand Oaks, CA: Pine Forge Press.
- Rosenstock, L. (1991). The walls come down: The overdue reunification of vocational and academic education. *Phi Delta Kappan*, 72(6), 434–436.
- Ryan, C. C. (1992). Advising as teaching. *NACADA Journal*, 12(1) 4–8.
- Sanders, J. M. (1992). Short-term and long-term macroeconomic returns to higher education. *Sociology of Education*, 65(1), 21–36.
- Schultz, T. W. (1961). Investment in human capital. *The American Economic Review*, 51(1), 1–17.
- Sheehan, E. P. (1991). University students' response to AIDS: A review of research with recommendations. *College Student Journal*, 25, 417–426.
- Simone, M. (1993). The big change in teaching foreign languages. *Planning for Higher Education*, 21, 15–20.
- Steen, L. A. (1990). Numeracy. *Daedalus*, 119(2), 211–231.
- Thurow, L. C. (1980). *The zero sum society*. New York: Penguin Books.
- Weisberg, A. (1983). What research has to say about vocational education and the high schools. *Phi Delta Kappan*, 64(5), 355–359.
- Wiggenhorn, W. (1990). Motorola University: When training becomes an education. *Harvard Business Review*, 68(4), 71–83.
- Wood, S. (1989). The transformation of work? In S. Wood (Ed.), *The transformation of work? Skill, flexibility and the labour process* (pp. 1–43). London, England: Unwin Hyman.
- Yarmolinsky, A. (1995). Reinventing liberal education. *Planning for Higher Education*, 23, 71–74.
- Zinsser, W. (1988). *Writing to learn*. New York: Harper & Row.
- Zuboff, S. (1992). New worlds of computer-mediated work. In H. F. Lena, W. B. Helmreich, & W. McCord (Eds.), *Contemporary issues in society* (pp. 86–98). New York: McGraw-Hill.

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