

# THE LIBERAL ARTS: PATHWAY TO SUCCESS

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My thanks to all of you here this evening for your warm welcome.

In recent months we've heard much about the need for change. The word *CHANGE* has almost become the buzz word of the year. A few weeks ago *TIME MAGAZINE* had an article on *CHANGE* and offered four strategies to get people to change their behavior but that is not my purpose this evening.

Change is inevitable. We are surrounded and impacted by the many changes that occur every day in our lives: changes in the weather, in our families, in our bodies, in our educational institutions, in our social, commercial, and political structures, and on and on, to mention only a few. Some of these changes occur automatically. They happen whether we want them or not. Other changes, however, are deliberately planned or designed to meet some new objective. For example, the knowledge we need to acquire in order to live productive lives changes as we grow from childhood to adulthood. Knowledge must be relevant to one's age, current needs, and goals in life. Knowledge is a broad subject. My remarks this evening will relate only to a small body of knowledge which we, in higher education, call, "the liberal arts." This term denotes a curriculum that imparts *general* knowledge unlike one that emphasizes *specialization*, for example, a vocational or technical curriculum.

The term “liberal” comes from the Latin word *liber* meaning free. In Greek classical times, the liberal arts described the curriculum proper to the free man and not for the slave. In the early Middle Ages, Martianus Cappella academically defined the liberal arts studies to be these seven subjects: grammar, rhetoric, logic, geometry, arithmetic, music, and astronomy. The term “arithmetic”, as we use it today, did not mean computation with numbers, rather the student studied the properties of numbers or number theory. The same might said of the other subjects as well, where the principles or properties of the disciplines were studied rather than their applications. These studies constituted the basic curriculum in the Greek universities, at the University of Alexandria, for example, and later in the medieval universities, e.g., Oxford and Paris. Around 1500, architecture, painting, and sculpture, then classified as mechanical and manual arts, were added to the liberal arts curriculum in Italy, due to the promotion of several Italian artists such as Leonardo da Vinci. It took another century before this change occurred in Spain and England.

The term “Liberal Arts Colleges” originated in Europe, but today usually refers to liberal arts colleges in the United States. Such schools emphasize study in the liberal arts. Programs vary from college to college; in other words, there is no common set of courses that make up the liberal arts curriculum. Harvard scholars study original works in the *Great Books Collection*, e.g. the writings of Aristotle, Euclid, Spinoza, Homer, Thomas Aquinas

and others. Other colleges specify general education requirements for all students in broad areas, such as the humanities, religion and philosophy, mathematics, and the arts and sciences. Still others are built around a theme that may identify the college or its specific mission. Some years ago the University of Wisconsin-Green Bay chose an environmental focus for its liberal arts curriculum. I may be wrong, but I believe that may have been changed. Rather than requiring specific courses, some colleges design interdisciplinary courses that all students take to satisfy their liberal arts requirements.

Whatever the nature of a liberal arts program for a specific college, it must be true to its own identity and mission and designed to fit the needs of the clientele it intends to serve and relevant to the place and time in which it is offered. Since these elements may change over time, it is important that a college periodically re-examine its liberal arts curriculum to determine its relevancy in content and delivery. The purpose of any liberal arts program is to provide a pathway to success in a more specialized study in the arts and sciences, or for more advanced study in a particular field, or in preparation for one's future career or profession.

Silver Lake College has re-designed its liberal arts program over the years. If you have been around here as long as I have, you might remember some of them. For one reason or another, there was a need to examine the program and, if necessary, to re-

design it or to make the necessary changes. I recall several forms which this body of knowledge took. In my day, we were required to take specific courses in nearly every discipline before choosing a major or minor. Later, related disciplines were taught as interdisciplinary courses and team-taught by faculty members from the various disciplines. A theme-based program entitled “The Christian Person: A Creative Response to Life“was introduced in the 1970s with its focus on the liberal arts curriculum. It provided both developmental and evaluation check points at the freshman, sophomore, and senior years. Difficulties arose with the introduction of new programs, such as the business program and the transfer of credits from technical colleges, the accelerated delivery format, and the off-campus programs. Changes became necessary. More recently, a set of four goals defined the liberal arts curriculum with a choice of approved courses to meet these goals. Currently, the liberal arts program is undergoing a further revision. Based on our Catholic, Franciscan tradition three signature courses are being developed to highlight the Franciscan way of learning. I am not the authority on this, so if you want more information on this exciting program, ask Dr. Albert Sears, who has been chairing the task force for this revision.

Having said all of this, you may be wondering what a liberal arts program, whatever its nature or form, can do for you. How can it become a pathway to success in your college years and in your future profession? Students sometimes ask, “Why do I

have to take these liberal arts courses, when I already know what I want to major in and what I want to do in the future?" How can a liberal arts program help me as a person, as a student, as a professional, and as an active participant in today's society? Numerous articles have been written on this subject, so let me just summarize some of the key benefits I see as benefits of a liberal arts education. My own broad background in the liberal arts and sciences testify to my own success in graduate studies and teaching career. More about that later, if time permits.

Just as our body needs physical exercise, proper diet, and sometimes professional help to keep it healthy and strong, so too, our minds need to be strengthened and our intellects ordered. Exercising the mind in one area strengthens it in others. Many disciplines can contribute to the exercise of the mind, but each in its own way. A liberal arts education can order the thinking process itself to avoid the pitfalls of fuzzy, rambling, and narrow minded thinking.

No matter what your future profession or job may be, you will face problem solving situations. Mathematics does not have a corner on problem solving. While I was studying at UW Madison, I lived with the Dominican Sisters at Edgewood College. Also living there was a Schoenstadt Sister, who had come to the U. S. from Germany after World War II. She had difficulty mastering the English language. On weekends she would visit

other Sisters from her community at their convent outside of Madison. At the time, I was taking a course in Topology. As an assignment the class was asked to prove or disprove, by finding a counter example, one hundred topological statements. I mentioned to this German Sister that I had a hundred *problems* to solve. She told me later, when she knew me better, that she said to her Sisters on the weekend, “I thought life in America was simple, but that Sister has a hundred problems!” In her eyes, I was a pretty mixed-up person!”

All problems are not mathematical. The late George Polya, out of Stanford University, in his little book, *How to Solve It*, outlines basic steps in *mathematical* problem solving. Yet some of the questions to be asked could apply equally well to non-mathematical problems. For instance, one might ask, “Is it within the realm of a particular discipline to even provide a solution?” Or, “Are there analogous situations, for which solutions have been found, that might provide clues to a solution of the present problem?” Or, “Is there enough information given, or do I need more facts?” Consider, for example, the problem solving activity that courts must engage in to determine the constitutionality of a decision or the legality of an act.” Polya’s questions could apply here as well.

Moving on to another benefit. Exposure to a diverse body of knowledge in a liberal arts education, enables the student to think for oneself and to develop his or her own opinions, attitudes, values,

and beliefs, rather than becoming a passive recipient of statements made by the so-called experts. Yes, you need to get the facts, but beware of accepting everything the expert says or writes to prove a point or to convince you to purchase Brand B toothpaste, because 95% of the dentists recommend it. Look more carefully at that 95%! How was it obtained? How many dentists were actually sampled? When I was teaching statistics, I recommended to my students that they read or at least examine, Darrel Huff's book, *How to Lie with Statistics*. Statistical fallacies in newspapers, advertisements, and speeches abound!

College is all about learning. But whose and what learning are we talking about? It is not the authors of the textbooks we use, it's not the well-educated professors on the college staff, it's not the content of the many disciplines and the textbooks from which one can choose. The role of a liberal arts education is to teach you, the student, how to learn, that is, how to organize ideas, to understand what you study, how to make your own judgments, and to give you techniques for retaining that information.

Learning is progressive. New knowledge builds on previous knowledge. Patterns that are set up in the brain enable one to learn faster and more easily. Good learning habits can be transferred from one discipline to another. Students prepare for their future endeavors, whatever that future career or profession may be. In other words, a knowledge of

different areas can enhance creativity. The wider one's information base is, and the more diversified, the greater the chance for creativity to occur in the development of new ideas.

Knowledge is holistic, not a collection of majors and minors. An overemphasis in one field of study gives only a partial view of reality. A view of reality that recognizes the interdependence and relationships among ideas, beliefs, and values is a benefit that a liberal education can provide.

The previously mentioned benefits apply to all liberal arts programs. What makes a Christian liberal arts education unique is the inclusion of the spiritual dimension in the development of the whole person. Quoting from the "Vision Statement" of Silver Lake College, we find concise statements relative to its vision of a Christian liberal arts education. (Quote)

In this Franciscan environment Silver Lake College offers students a share in the Christian cultural heritage of a liberal arts education. A foundation in the liberal arts provides avenues to search for truth, beauty, goodness, and meaning in life and to promote holistic development in order to empower students to actualize their God-given potential. (End of quote)

In the search for truth, Cardinal John Henry Newman asserts that no one science, nor even all secular sciences can provide the whole truth. Goal

2 of the Religious Studies and Philosophy Department states:

(Quote) “The student will:

. . . Examine the meaning and purpose of human life, as reflected in the Judeo-Christian and Franciscan values, including relationships within a changing universe and moral responsibility to self, others, and God.” (End quote) Goal 2 of the Theology Program further addresses the Vision Statement in these words: (Quote) “The student will develop a critical awareness that empowers the moral decision-making processes within the Judeo-Christian and Franciscan heritage;” (End quote)

Silver Lake College is not alone in regularly re-examining its Liberal Arts Education Program to determine whether it remains true to its identity, its vision and goals, and its relevance to today’s world. A recent article in the February 25, 2009 Issue of the *New York Times*, entitled: “The Humanities Must Justify Their Worth” by Patricia Cohen, speaks to this concern of higher educational institutions. I would like to quote a few passages from this article.

(QUOTE) One idea that elite universities like Yale, sprawling public systems like Wisconsin and smaller private colleges like Lewis and Clark have shared for generations is that a traditional liberal arts education is by definition, not intended to prepare students for a specific vocation. Rather, the critical thinking, civic and historical knowledge and

ethical reasoning that the humanities develop have a different purpose: They are prerequisites for personal growth and participation in a free democracy, regardless of career choice.

But in this new era of lengthening unemployment lines and shrinking university endowments, questions about the importance of the humanities in a complex and technological demanding world have taken on new urgency. Previous economic downturns have often led to decreased enrollment in the disciplines loosely grouped under the term “humanities”-- which generally include languages, literature, the arts, history, cultural studies, philosophy, and religion. Many in the field worry that in this current crisis those areas will be hit hardest. (End quote)

And finally, this third passage is particularly relevant today:

(QUOTE)

With additional painful cuts across the board a near certainty, even as millions of federal stimulus dollars may be funneled to education, the humanities are under greater pressure than ever to justify their existence to administrators, policy makers, students, and parents. Technology executives, researchers and business leaders argue that producing enough trained engineers and scientists is essential to America’s economic vitality, national defense and health care.

Some of the staunchest humanities advocates, however, admit that they have failed to make their case effectively. (End quote)

A dismal picture, to be sure! However, Anthony T. Kronman, a professor of law at Yale, presents another side to this issue. He believes that the humanities are more urgently needed today than in the past (quote) “referring to the widespread indictment of greed, irresponsibility, and fraud that led to the financial meltdown,” (end quote) In his view, this is the time to re-examine (quote) “what we care about and what we value, a problem the humanities are extremely well-equipped to address.” (end quote)

In conclusion, I would like to tell you briefly what a liberal arts education has meant to me both in my doctoral work and as a professor of mathematics at Silver Lake College. Throughout my undergraduate and graduate years of study, I obtained an exceptionally broad background in the arts and sciences, combined with the study of Latin and French. Later I had a brief exposure to Greek and German. Numerous mathematics courses taken throughout my years of study gave me a wide background in several branches of this discipline, including foundations, number theory, algebra, geometry, analysis, topology, statistics, and mathematics history. Basic studies in biology, chemistry, physics, and physiology prepared me for study in the history of science offered by the Humanities Department at the University of

Wisconsin. It was from this department that I received my doctorate. Since I was preparing to write my dissertation in medieval mathematics history, I was required to take two courses in medieval and Renaissance cultural history courses from the History Department. The interdisciplinary nature of these courses enables one to place a specific discipline (in my case, mathematics) in the context of the arts, sciences, philosophy, and religion of these periods.

Needless to say, without my background in medieval cultural history and the Latin language, I would never have been able to write my dissertation. I owe my training in reading the Gothic script, used by scribes in copying Latin manuscripts, to my major professor, the late Marshall Clagett, a noted scholar of ancient and medieval scientific and mathematical works.

Greek classics were translated into Arabic during the so-called Dark Ages. Then with the re-awakening of interest in the Greek works, scholars translated these Arabic works into Latin. Two major translators of this period were Adelard of Bath and Gerard of Cremona. Professor Clagett allowed me to use his collection of microfilms of the 12<sup>th</sup>-15<sup>th</sup> century Latin manuscripts of Euclid's *Elements* that he had found in the libraries of Europe. The scribes, who copied the translations onto parchment, are identified by their copying style, especially by the marginal designs they used to decorate the transcription. It was their signature. One such

scribe copied many of Gerard of Cremona's translations. Professor Clagett was almost certain that this scribe would have copied Euclid's *Elements* also, but he was never able to find such a manuscript.

Around that time, I had heard that the Knights of Columbus had financed the microfilming of manuscripts in the Vatican Library which were to be housed in the library of St. Louis University. I thought it would be worth a try to examine a listing of this collection. I was allowed to fly to St. Louis in the hope of finding a Euclid Manuscript. After reading through frame after frame of an inventory list, I found one that looked like it might be Euclid. I copied the necessary information to take back to Madison. The University purchased the microfilm for me. I took it to Professor Clagett, who identified it as a 14<sup>th</sup> century manuscript of Gerard of Cremona's translation of the *Elements*. In addition, he recognized it as a manuscript copied by the same careful and accurate scribe who had copied Gerard's other translations. He was delighted and so was I! This manuscript turned out to be the easiest to read and the most accurate of all the manuscripts I used in my dissertation. It was the highlight of my research! If you are interested, take a look at a copy of my dissertation and see what Book 1 of Euclid's *Elements* looked like in the Middle Ages. The two volumes are on display on the table.

Teaching mathematics in a small college, such as

Silver Lake College, requires the instructor to teach courses in many branches of the discipline, not only in one's area of specialization. I certainly was not an expert in any branch, except maybe in a specific period in mathematics history, but with my broad background in graduate level mathematics courses and regular independent study, I was able to handle the undergraduate mathematics courses in the curriculum. Of course, my favorite was and always will be, the teaching of the History of Mathematics. However, I did manage to sneak in some historical topics, no matter what mathematics course I was teaching.

I've been asked several times, "When did mathematics begin?" My answer is always that the history of science and mathematics is like a history of civilization. What can be more ancient, broadening, and worldwide than that! The contributions that the many and diverse civilizations of past centuries have handed down to us are stepping stones to the more specialized, sophisticated studies and applications we have today. We cannot but admire and appreciate what has gone before us in civilizations around the globe. We can learn from the successes and failures of our predecessors. Hopefully, we can build on the former and avoid the latter.

My conclusion is a challenge to all of you here, both students, who are still taking liberal education courses, and to everyone, no matter what your job or profession may be, is to become involved in a

liberal arts experience. You don't necessarily have to take a college course; there *are* other ways. As I quoted earlier, this experience is more needed today than ever before. You may have to become a perpetual student to even scratch the surface of what there is to offer, but you won't regret even that little bit. My own background is a testament to that fact.

At this time, I would like to express my thanks to my Religious community for giving me the opportunity to engage in educational studies from high school through graduate school. Teaching in secondary schools and at Silver Lake College reinforced my education. The opportunity to teach the subjects I studied and was most interested in, has been a rewarding experience. I owe thanks, too, to my colleagues in higher education, the people in the local community, and my former students for being a part of my life. I learned from all of you; you were a part of my ongoing liberal education. And finally, thanks to all of you here this evening, for honoring me with the reception and allowing me to share my research and personal thoughts on a liberal education as a pathway to success.