

Aims of Education XIV 2006-07
The Liberal Arts: A Conversation Across Space and Time
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Since it was first presented in 1993, Chapman University's annual Aims of Education Address has become a cherished tradition. It is presented each year at the university's Opening Convocation for new students and their parents – a gathering of more than 1,000 people whose enthusiasm, curiosity and high spirits fill the room with a remarkable energy. The excitement grows as they watch our faculty process in full regalia – always a colorful and impressive display. This address is the highlight of the convocation – a chance for our distinguished faculty members or administrators to share ideas about the quest for knowledge and the search for truth – those eternal and elemental underpinnings of a university education.

This year, I asked our new provost and executive vice president, Dr. Daniele Struppa, to present the Aims of Education speech. A distinguished mathematician, Dr. Struppa surprised all of us by using an immortal work of art as the centerpiece of his speech. But, as he points out so eloquently here, the juxtaposition of art and mathematics is not so unusual, after all. In fact, all of the liberal arts – literature, philosophy, music, visual arts, the sciences, history – interweave tightly throughout human history, and speak to us across the ages. From the great thinkers of the past to the teachers and young scholars of today, this conversation is unbroken.

I'm sure you will enjoy Dr. Struppa's thought-provoking and engaging welcome to our new students.

-James L. Doti

The Liberal Arts: A Conversation Across Space and Time

Good morning students, parents, friends, trustees and faculty. It is an honor to be invited to deliver an address with such an important title: "The Aims of Education." As some of you may know, this is actually the title of a very important essay by one of the great American intellectuals of the last century, Alfred North Whitehead, written originally almost 100 years ago, back in 1912.

I will begin my remarks by quoting some lines from a book he wrote, whose first chapter is in fact this essay.

"One main idea runs through the various chapters [of this book]... It can be stated briefly thus: The students are alive, and the purpose of education is to stimulate and guide their self-development. It follows as a corollary from this premise, that the teachers also should be alive with living thoughts."

I could not agree more with these words. What I would like to do in the next few minutes is to explore with you my interpretation of this notion of "living thoughts," and see how the liberal arts, which are the core of what we will be teaching our new students, are an embodiment of such a notion.

The title I have offered for my address is “The Liberal Arts: A Conversation Across Space and Time.” I will have to explain that, and show you how this connects with the notion of “living thoughts.”

I will begin by illustrating my point with a picture.

What you see here is a very famous and beautiful painting By Raphael. To see the original, you would need to go to the Vatican Museum, pay the ticket for the Sistine Chapel, and walk through the many astonishing rooms of the Vatican palaces. As you slowly progress through the crowd, you will reach what is called the “Stanza Della Segnatura,” and on one of the walls, you will see this fresco, whose title is “La Scuola di Atene” (The School of Athens). This painting best illustrated my view of liberal arts as a conversation.

Let us take a few minutes to see who the characters in this painting are. Incidentally, one of the fascinating aspects of this painting is that we can read it in two ways. On one hand, each figure represents an important philosopher, scientist, mathematician from the ancient world. On the other hand, many of the actual faces of the figures are famous people from Raphael’s own time (including a self-portrait of Raphael himself, in the lower right corner of the painting).

Let us begin by looking at the figures in the center. In the middle of the painting, you see in a red and blue robe, pointing at the heavens, Plato, and with him he carries a book under his arm. It is one of the most debated and analyzed books he ever wrote, the *Timaeus*, in which he discusses the origin of the universe. We could talk about it for hours, but I have been told I have a limited time today, so if you want to hear about the *Timaeus*, and what music has to do with the creation of the universe, you will just have to come to one of my classes! Before we abandon this image, note that Raphael has in fact represented Plato with the face of Leonardo da Vinci. To his left (to his right for us looking at the painting) we see Aristotle, and he also holds a book – and if we were close enough, we could read a title: *The Ethics*. It is almost as if Raphael wanted to make sure we understand that the nature of learning is not just about physics, mathematics, and logic, but it must encompass the understanding of ethical values. It is certainly interesting to note that Plato was in fact Aristotle’s teacher, and therefore we see here, as if hinted, the notion of conversation between a teacher and his student. But Raphael goes beyond that.

Look to the right of Plato (to the left for us), and you will find a man dressed in a green robe standing next to a much younger man. The young man is Alexander, himself a student of Aristotle...and there are many beautiful and enlightening anecdotes one could quote. The older man is Socrates, who was Plato’s teacher.

So, there you have it. These four figures represent four generations of thinkers. It is quite certain that they never stood once in the same room, but Raphael brings them together exactly because what matters is the conversation which links them. Philosophy and knowledge are shared and transmitted across different generations. Sometimes it is through writing, but nobody thinks in isolation. The entire process is guided by this conversation across time.

I want to leave you the pleasure of exploring this painting on your own, but there are at least a couple more points I want to draw. *Timaeus*, the man who gave the title to Plato’s dialogue, was a man from Southern Italy, from the town of Locri, in Calabria. He is described by Plato as a Pythagorean, namely a follower of

that great mathematician/ philosopher/ musician whose name you know, if nothing else because of the theorem which carries his name, and which, in fact, is not even due to him! So, in a way Pythagoras himself is a part of this conversation. And indeed, if we look again at the painting, we discover him in the lower left corner, dressed in a red and white robe, writing on a book.

Since globalization is such a hot word right now, and we almost believe we have discovered it ourselves, it is probably worth taking a look also at another important character behind Pythagoras. This man has dark skin and is depicted with a green robe, leaning forward, almost as if looking over Pythagoras. This character is the famous Islamic commentator Averroes (or Ibn Rushd as he would have been known), who lived in Cordoba in the twelfth century. Averroes was a very influential religious philosopher who established the importance of the use of reason in matters of faith. Isn't that a striking thought, at this dramatic junction of time? At the request of his caliph, he wrote a series of summaries and commentaries on the work of Aristotle and on Plato's *Republic*. It is not an exaggeration to say that we, in the Western world, know Greek thought because of the work Averroes and other great Arab commentators on Aristotle.

Thus, we now see how the conversation that is described by Raphael is not just across time with different generations of scholars, but is also a conversation across space. Averroes was born in Cordoba, worked in Marrakech, and influenced dramatically our Western philosophy throughout early Renaissance. So, maybe, the global nature of education is not a new concept. And, lest you think that only men can participate in this conversation, please look to the right of Averroes, just above Pythagoras, and you will see a female figure in a white robe. Granted, she is the only woman in the entire painting, but "The School of Athens" was painted in 1509. The figure is Hypatia of Alexandria, the first great woman mathematician recorded in history.

But what is the content of this great conversation, which is so important to compel people into continuing it across space, across cultures and across time? When we look at the painting of Raphael we see that in the midst of the Italian Renaissance, scholars (and not just scholars, but also just well-educated people) were interested in the work of Pythagoras, Euclid, Plato and Aristotle. All this work was at least 1,500 years old, if not more. Why was it so relevant in the early Renaissance? But let's not stop with the Renaissance. Even today, if we take our kids to high school, we see that they study the same geometry that Pythagoras and Euclid studied more than 2,000 years ago. And in college, we still read, discuss and analyze the work of Plato and Aristotle. Even postmodern scholars, while breaking the mold of traditional Western culture, still consider the work of Aristotle and Plato a fundamental reference. There must be something really timeless, really essential, in this conversation.

The answer, it seems to me, lies in the nature of the questions that were asked by the characters that populate Raphael's work. If we understand that nature, we understand what the liberal arts really are all about, and why they are so important now, today, for the education of our citizens.

The nature of the questions, which were asked by those characters, is *universality*.

What the Greeks had realized (maybe before any other civilization) is that what is really important is not the answer to a specific question, but rather the universal character of the question that is being asked.

Let me give you an example from mathematics, which I hope will be clear enough to highlight what I have in mind. The geometers of ancient Egypt had uncommon skills. They probably knew the Pythagorean theorem, understood some of the most basic formulas of trigonometry, and were able to apply them to highly sophisticated problems of astronomy and geometry (in the etymological sense of the word: measuring the earth). But what they did not have, and what did not appear until the birth of Greek geometric thought, is a systematic way to look at geometrical properties as particular cases of a very general scheme of thought, the scheme of axiomatic Euclidean geometry. If you think I am using complicated words, allow me to simplify what I have just said. What the Greeks had invented was the geometric system that our kids study in junior high school right now. A system by which you assume a few simple original concepts (point, line, plane), satisfying a few simple properties (for example, there is only one straight line through two assigned points) and a few rules of inference, and then use those rules and those concepts to construct a theory of unimaginable complexity and effectiveness. When Euclid wrote *The Elements* (a canonical text, if there was ever one!), he wrote the definitive text in geometry. Its work is not devoted to a specific question, but rather provides a universal treatment of space.

You may think that this approach only applies to mathematics, and to geometry. But in fact, this very country is based on a process that follows Euclid's path. We all remember the immortal words: "We hold these truths to be self-evident, that all men are created equal, that they are endowed by their creator with certain unalienable rights..." Our founding fathers, when they uttered those words, were following the Euclidean axiomatic method: some truths are self-evident, and are the starting point for the entire theory of democratic self-government. We should point out that the use of Euclid as a model for our Declaration of Independence is not an accident, nor will it surprise anybody who knows how much of a classical scholar Thomas Jefferson was.

The Greeks were obsessed (maybe the word is too strong) with the search for universals, for rules, ideas and processes that would outlive the contingent question, and address the general, all-encompassing truth. In arithmetic, the basic concept was "number" and Aristotle (in his *Metaphysics*) quotes Pythagoras as saying "the number is the nature of things." Let us be careful here: when Pythagoras says that the number is the "nature" of things, he has in mind something much more sophisticated than what we have in mind now when we try to mathematically interpret reality. For us, numbers are a way to describe reality. For Pythagoras, they were reality.

In music, the basic concept was " $\Phi\theta\omicron\gamma\gamma\omicron\varsigma$ = phthongos," which the dictionary translates variously as "tone" or "pitch," or again "note;" this concept became the basis for one of the great texts of early musical theory, *Ta Katatome Kanonis* (The Division of the Canon), which is written in Euclidean style, and offers the basis for the early theory of Western temperament.

Finally, in the realm of ideas, the basic concept was “λογος = logos,” a word that cannot be translated without losing its sense. The beautiful Gospel of John begins with these unforgettable words: “In the beginning was the Word, and the Word was with God, and the Word was God.” But the actual Greek term that John uses for “Word” is in fact “logos.” Thus, we see that this beautiful line in Gospel is really a cosmological statement, a statement that recognizes within the framework of theological discourse the existence of a unifying principle.

This is what the Greeks were after. And this, in my opinion, is what the liberal arts are: a constant search for the universal unifying principle. This is what makes the liberal arts so contemporary, so compelling. This is the content of the conversation that we initiated almost 2,500 years ago, and which has no end.

When a musician sits at the table and struggles to compose a score, he is not answering a need for entertainment. No, he actually struggles to represent universal values and ideas through a language that is constantly redefined, and yet was created thousands of years ago. He is not alone; he follows in the footsteps of Pythagoras. When a biologist attempts to unravel the behavior of proteins within human cells, she is not just trying to cure a disease, but rather she is trying to discover the nature of life, the fundamental universal principle behind life, the beautiful and yet terrifying process by which cells learn how to become immortal, and in so doing decree the death of the host organism. As such our biologist is following in the footsteps of the early pre-Socratic philosophers, wondering about this same question (if you go back to our painting, you will find many of them peppered around us to Mars and beyond. Once again, we follow the footsteps of Ptolemy (you can find him in Raphael’s painting), trying to answer the universal question of the origin of the universe.

Well, now you, our new student, are entering this conversation. The work you have done in high school has prepared you by giving you some of the tools, some of the language you need. But you have probably never reflected on the purpose of education in the way I hope you are reflecting now. As you enter the conversation, we would like to be your hosts to introduce to you some of the participants, help you understand their language, and – most important – help you contribute your own ideas and thoughts to this never-ending search. It is a daunting task, but also an incredibly exciting one. It is daunting because you will be in a conversation with people such as Euclid and Plato, and more recent interlocutors such as Newton, Beethoven, Shakespeare, Einstein, Picasso. But it is exciting because, in the words of Whitehead, you will be dealing with living thoughts, and your teachers (themselves participants in the conversation through their own ideas and work) will be working with you to nurture such thoughts. We stand ready to work with you, to dialogue with you, and to continue this wonderful, never-ending conversation.

Good luck, and welcome to Chapman!

About the Speaker
Daniele C. Struppa, Ph.D.

Dr. Daniele C. Struppa has a Ph.D. in mathematics from the University of Maryland (1981) and joined Chapman University as provost in July 2006. Prior to coming to Chapman University, Dr. Struppa had a distinguished career as a professor of mathematics, and occupied positions at the University of Milan (Italy), at the Scuola Normale Superiore in Pisa (Italy), at the University of Calabria (Italy) and, since 1987, at George Mason University. He is the author of more than 100-refereed publications, including two books, and he is the editor of several volumes.

While at George Mason, Dr. Struppa served as director of the Center for the Applications of Mathematics, as chair of the Department of Mathematical Sciences, and as associate dean for graduate studies. In 1997 he was selected dean of the College of Arts and Sciences at George Mason University, a position he held until he joined Chapman University.

Dr. Struppa has served on the boards of numerous non-profit organizations, such as the George Mason University foundation, the Fall for the Book Festival, the Virginia Foundation for the Humanities, the Center for Media and Public Affairs, and the Center for the Arts and Policy.