

Construction and Culture: A Built Environment

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The purpose of this article is to update and inform construction educators about an “unconventional” course introduced into the curriculum at Arizona State University’s Del E. Webb School of Construction (DEWSC) in the spring of 1991. Now that 18 semesters have passed and almost 2,500 students have taken the course, it is an appropriate time to report on the lessons learned. Also, the authors have just published a textbook for the course that was used for the first time in the fall 1999 semester (see references). Perhaps other schools would be interested in adopting a similar course within their own programs. The freshman-level course, CON 101, *Construction & Culture: A Built Environment*, satisfies three university General Studies requirements: Humanities (HU), Global Awareness (G), and Historical Awareness (H). While it may not be unique to the university-based construction curricula within the Associated Schools of Construction (ASC), it was certainly new to our curricula. The first course offering in 1991 had one section with 35 construction students. Today, (December 1999) we have three sections containing over 260 students representing many of the disciplines offered across the campus.

Key Words: Construction education, culture, historical, global, built environment, constructor, certification

Introduction

The purpose of CON 101 is to broaden the student’s awareness of the significance of construction as a discipline that affects, and is affected by, ethical, societal, and historical values in all societies. Due to the rapid evolution of construction, and an increased specialization and sophistication of technology in terms of materials, equipment, methods and processes, the construction industry continues to have an ever-increasing impact on humanity. Crises such as the proliferation of hazardous waste and the pollution of the environment, as well as the overloading and deterioration of the infrastructure in all parts of the world, find both their genesis and their solution in the “built” environment. CON 101 is designed to address the effect that construction has had on our human and cultural values. By studying the evolution of building from the earliest shelters to the pyramids of Egypt and the temples of Greece, through the roads and aqueducts of Rome and the Great Cathedrals of the middle ages, to simple Irish farmhouses, students are given an understanding of how construction fits into what we define as “the built environment” (Clark, 1985). They can also come to appreciate the effect that human values and *culture* have had on the actual construction process as a whole. In our opinion, it is imperative that we study these civilizations as a method of learning from past successes and errors. Perhaps there are lessons that we could apply to our practices today as we prepare to enter a new millennium.

Following the historical analysis, CON 101 addresses the contemporary world from a global perspective. By analyzing the breadth of the construction profession today, the freshman student will better understand the physical world that he/she lives and perhaps establish personal ethical standards to adjust to this world. With the increased participation of foreign construction firms in the U.S., we need to become acutely aware of the innovative and challenging philosophical changes that are taking place in the construction process and the relationships between those involved in the process. For example, terms such as "Build-Operate-Transfer" and "Design-Build" were not even heard of 20 or so years ago.

Developing the Course Philosophy

CON 101, "*Construction & Culture: A Built Environment*," is intended to give the beginning student an overview of the *origins* of construction such that he/she might better relate to the physical aspects of the industry. Unfortunately, the perception that the majority of people have of "construction" is that it is simply a vocationally or "trade-based" industry, which has an impotent set of ethical guidelines, and is often times an irritation and inconvenience to their lives (Mulligan & Knutson, 1999). CON 101 stresses the importance of construction as a *profession*—one that is rooted in education and requires a strong code of ethics if we are to gain the recognition and respect of those outside of our industry. By studying the historical origins of the construction process, the student should grasp the significance of the extensive impact on the moral and cultural values of people down through the ages and in all parts of the world.

The Historical Impact

CON 101 initially focuses on the historical relationships that have made an impact on the construction *process*, which all began with man's first efforts to utilize the elements provided by nature and build upon these as a means for survival. Later, man's objectives became more sophisticated as the refinement of his tools and materials, along with an increase in knowledge, evolved. Soon these new discoveries became a major factor in influencing and/or modifying the social and cultural customs of a civilization, as increased emphasis was placed more on human values (e.g., comfort and aesthetics) than on mere survival (Fitchen, 1990). Even today we see that the "built" environment within which we carry on our day-to-day lives biases our decisions for future generations. Societal involvement in the construction process per se is becoming more and more apparent as we recognize the impact that development and construction have had on what we might classify as a "quality of life." If an individual's quality of life is to be one of the principles by which we quantify our standard of living, then we can unequivocally state that construction has played a major role in establishing the values that we will accept. Many times society—the general public—can influence not only what gets built, but also what *doesn't* get built. One could also debate whether the construction process is the *cause* or the *effect* in establishing human values; however, if it were not for continual *technological* improvements in this process, it is unlikely that we would see many of the cultural and societal changes that have occurred. For example, the introduction of steel into the building process created the skyscraper, which has altered the way we live and work in ways never dreamed of 200 years ago. The incorporation of air conditioning into work places and residences illustrates how vast regions of

the world were opened to populations that would have previously considered these areas uninhabitable. And there are many more examples.

In fact, a genuine cultural bond linked to construction has existed for centuries. The Pyramids of Egypt were built by a civilization that had a strong belief in the afterlife and an unwavering respect for their leaders. An entire set of human (and spiritual) values was formed around the philosophy of building and “individualizing” the pyramids of Egypt for the pharaohs, as it was felt that the immortalization of a pharaoh could be accomplished only by preservation in a virtually indestructible structure. The gigantic tombs that dot the landscape near Cairo would make absolutely no sense at all today, unless one wants to market a gambling casino in Las Vegas or participate in a mass funerary complex in Florida! But in 2500 BC they made perfect sense. We can also find many *parallels* in our evolution of civilizations. The Flavian Amphitheater (Roman Coliseum) was built in AD 72 in response to a highly sophisticated Roman culture that craved competition. In our metropolitan area, no less than *three* ballparks/stadiums/arenas have been built recently or are being planned to satisfy a highly sophisticated Phoenician culture that also craves competition. In other words, not much has changed over the past 2000 years. Whether it is the Christians versus the lions or the Arizona Cardinals versus the Detroit Lions, a society that is technically advanced and enjoys a high level of creature comforts, is most likely driven to thrive on highly competitive athletic events and contests.

The Great Wall of China is an example that symbolized the isolationist movement and cultural repercussions of that era and was built to literally keep people “out” (Sandstrom, 1970). In contrast, the Berlin Wall was constructed to literally keep people “in,” reflecting an entirely different societal philosophy. In the end, both were failures.

If one researches the early Grecian approach to construction, he/she would find an extraordinary tendency to finish even the unseen (or hidden) details of a building. To the Greek builders, the act of building was an act of worship, as the gods could easily see under and/or behind an eave, an entablature, or a corbel. However, the approach the Roman builders took to the same detail was much more pragmatic, or secular, in the sense that they would likely eliminate any feature nor would they spend time finishing areas that would be unseen by the casual observer. We can also readily discover that the Gothic cathedrals of Europe, in all of their magnificence, reflected—in addition to the skills and personal characteristics of the Master Builder—the religious-based culture of the Middle Ages. Even the “hippie” communes of the 1960s were an expression of cultural beliefs that were rooted in the existing political milieu.

In all of these examples, the point is that “something” was built in response to a human requirement that was dictated by a change in, or modification to, accepted cultural practices. Whether these practices involved religious beliefs, defensive concerns, social mores, or environmental considerations, is irrelevant. What *is* important is that customs and values have been *changed by, supported by, and influenced by* the evolution of the overall construction process? Yet, as mentioned previously, no one is absolutely sure whether the construction practices of an era *reflect* the culture of that period, or *affect* it. Most likely, they do both.

The Global Impact

The Global Awareness concept of CON 101 addresses contemporary issues, rather than the historical aspects of construction. We needed to address the history in order to link the past with present-day cultures and societies as a method of emphasizing the impact that these former events, methods and practices have had on today's values. Recall the quote from Winston Churchill: "*The farther back you can look, the farther forward you are likely to see.*"

The whole purpose of the Global Awareness requirement is to assist our students to take a broader view of the current issues, to understand the social, technological, ethical, political, and/or environmental problems as *international* problems in a shrinking world. The influence of rapid (instant!) communications has shrunk our world and we need to focus on the *cultural* impact that construction has from a global perspective. We hope to leave the student with a greater appreciation for the effects that ethical and human behavior, as related to construction, have had on all societies.

Our *ultimate goal* in the Global Awareness part of the course is to expose freshman students to construction from an entirely different perspective. We would hope that this might instill in them a desire to develop their own personal set of moral and ethical standards. As such, we want to explore the global impact of environmental, political, and economic events and trends on society as a whole. Each of these in turn has a significant impact on the business and economic climate within the construction industry. We want to identify those critical global issues and focus attention on the significant forces and problems that shape our industry.

Course Content and Structure

Without going into too much detail and incorporating the entire syllabus, we would like to share with you the general format that the course has evolved into over the past several years. First of all, after a trial run this past semester (fall 1999), we are going to go "on line" for much of the course materials, grading, assignments, and notices to the students. We have done some comparative studies on the value of using the web and a separate article will be written on the details of the analysis. Suffice it to say that the results have been very positive and have improved both the instructor's and the students' experience.

The course follows the textbook through twelve chapters that begin with the evolution of civilization and end with the global construction market in the 20th century. We cover such topics as learning from the built environment and from the failures that have occurred; a fundamental description of structural forces; how the interior environments have been controlled; falsework and its importance (Fitchen, 1990); and the people who have made this industry so great—an entire chapter that profiles the builder and another chapter that deals with the origins of the labor force. There are also three "specialized" chapters. One is on transportation systems, one on the cathedrals, and one on the Pyramids of Egypt. A list of ten review questions is at the end of each chapter, which we use for homework assignments.

Students are also required to complete three two-page reports during the semester and a ten-page research report at the end of the semester. We vary the content of the shorter reports, but generally the first one will include a visit to one of two local museums and reporting on the early Native American structures. The second report requires them to select a current construction-oriented article from a journal, a periodical, the Internet, or even the newspaper, and analyze the importance and relevance of it to the course and the construction industry. The students are required to comment on such items as the culture of the society that built the structure, how it was built, and materials/tools used in each of the first two reports. The third exercise challenges their creativity by asking them to build a colony on the moon (for example) using a minimum of guidance and a lot of imagination. Some of the submittals are absolutely incredible, outlandish, unbelievable, extraordinary, etc. But they are also refreshing, intuitive, innovative, and fun to grade! The final research paper is based on an assigned topic anywhere from “A” (*Aqueducts of Rome*) to “Z” (*Zeus and Hera Temple*) and it involves a significant historical construction project. It must be written following a very strict format, including an abstract and a bibliography with a minimum of three references.

In addition to the occasional “pop quiz,” students take two multiple-choice exams (about 50 questions each) and a 100-question, comprehensive final exam. Also, there is a provision for a student to obtain extra credit by sharing with us some item of topical interest. The class meeting times range from 50 minutes, three times per week to one hour and 15 minutes, twice per week. All of the “core” presentation slides are available to the student on the web.

Our selection of instructors to teach this course is based on several criteria, such as: *interest* in teaching such a course; ability to work with a diverse group of students; knowledge of, and interest in, the historical beginnings of construction; knowledge of, and interest in, the global issues facing the industry today; and their own personal motivation and creativity. We have been very fortunate over the past several years in identifying the *right* people and have never had to go outside of the DEWSC for a CON 101 instructor. However, during the spring 1995 and spring 1997 semesters, instructors visiting the DEWSC from the United Kingdom on faculty exchanges taught a section of CON 101.

The instructors can use either overheads or Power Point for their lectures and discussion. Each of the chapters has a complete set of slides that are augmented by special interest photos and/or articles. For example, when we discuss the many ways that builders have learned from failures caused by natural disasters, there is usually a current catastrophe (hurricane, tornado, flood, etc.) in progress somewhere in the world that can be used as a model for how to build to withstand the forces of nature. There is also the dark side of these events that reveal such things as “shoddy construction” or Jerry building or ignorance of building codes.

Feedback from Students

The feedback from the students via student evaluations and informal surveys has always been very positive. Some examples from a recent section included the following comments under the heading "What did you like most about the course?"

"I thought it was very interesting. It covered many historical landmarks and concepts. It also covered interesting (projects) of the present."

"Learning about construction history."

"The course was engaging, fun, and interesting."

"Learning about historical construction of houses and buildings around the world."

"Was interesting. Kept me awake."

The only constructive *criticism* challenged the time of day (late afternoon) and the lack of an adequate textbook (this was part of the motivation in writing a textbook for the course). To be fair, we have also had a few *non-constructive*, unprintable criticisms that usually were targeted at a specific instructor(s). Usually the comments have nothing to do with the course and are based strictly on a personality conflict or a low grade on a paper. Anyone who has been teaching for any length of time will get his or her share of these inevitable comments. Right?

Conclusions

ASU's Del E. Webb School of Construction took somewhat of a risk by making a humanities course part of the *core* curriculum because it is such an extreme departure from our more standard construction management courses. The objective was to stimulate the students' creative and conceptual skills and allow them to *think* about other issues related to construction rather than the typical physical entities of design, materials, methods, financial control, and management. We believe that now, with eight years under our belt, that the course has proven to be a winner. Not only has it given the new construction student an overview of the building industry, it has allowed us to communicate with students in a broad range of disciplines across the campus. One of the current sections has students from computer systems engineering, pre-business, civil engineering, computer science, architectural studies, electrical engineering, justice studies, chemical engineering, communication, recreation studies, history, and a large population of "undeclared" students. This "mix" has had two very positive effects. The first is that with the merging of students from varied areas of study creates an atmosphere in which there is an exchange of ideas, bringing an entirely new dimension to the construction classroom. The second positive effect is that it has served as one of our most productive recruiting techniques. This is most likely due to the fact that most CON 101 students are freshmen and about 50% entering ASU are "undeclared" majors. We generally have at least two to three students from each of the three sections change their major to construction.

In conclusion, we have tried very hard to impart a more professional *image* of construction to these students. We have emphasized the importance of their education as a stepping-stone to certification and introduce the reality that it is now possible to become a *Certified Professional Constructor*. In fact, the address, phone number, and fax number of the AIC Constructor Certification Commission is clearly highlighted in Chapter 3 of the text!

References

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