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A FEASIBILITY STUDY OF CONTINUING EDUCATION FOR LICENSED CONTRACTORS IN THE STATE OF FLORIDA

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EXECUTIVE SUMMARY

This study explores the possibility of using continued education as a means of combatting the continuous change of technology and of society that occurs within the Construction Industry. It also provides a model to aid in maintaining long term compliance of the contractor. Unlike traditional higher education, which is unable to respond immediately to the needs and interests of students, continuing education is able to immediately respond to these needs and to provide information on changes in codes, social mores and other governmental requirements to the contractor.

Those who argue that professionals strongly oppose mandatory education are not entirely wrong. The higher the educational level of the professional, the greater his recognition of the fact that it is necessary for him to continue his professional education to stay competent. Contractors on the other hand, appear to contest mandated continuing education as a condition for relicensing. A few of the more technically oriented construction disciplines do perceive the need for such a program, however, this does not generally include the general, commercial, or residential contractor.

The following statement summarizes most contractors' attitudes towards continuing education . . . "I feel that any continuing education program for unlicensed contractors would be another unnecessary bureaucratic burden placed on contractors who are already faced with enough problems." (anonymous)

Technology has advanced through man's search for knowledge and man tends to learn from his mistakes. However, change has become so rapid that the contractors are unable to base their knowledge on experience and have to deal with new problems, particularly those of the environment, codes, materials, and others that occur almost on a day-to-day basis.

Failures in the construction industry will inevitably occur because of these rapid changes which the contractor is unable to comprehend or adjust to. To reduce the causes of failures and to keep-up with the times,

it is necessary to change with these fluctuating times. The public needs and deserves protection against these changes which will result in problems with the product.

Since contractors are faced with innumerable costs, some of which are land, labor, materials, and taxes, the contractor is continually attempting to minimize these costs in order to be competitive in the market place. Since the industry has failed to police itself, it thus becomes the duty of the state to insure that customers are not making a quality/cost trade-off at quality levels that are below some established minimum standard. Since technology and economic changes have become common, everyday occurances, their regulation by the state may not keep up with these changes, however, many changes in regulations do occur. Those who wish to have stability in the construction industry have found it less and less likely to occur.

To stay up-to-date, a professional needs a designed study plan. Over one thousand (1,000) surveys were dispensed which disuss not only the question of whether continuing education should be required, but also what pertinent issues need to be updated. The results show the need for a competency based continuing education model, one that accommodates the attitudes and needs of the construction practitioner. The results also indicate a greater understanding of the need for education on the part of the educated contractor, normally those at the general contractor or developer level as opposed to the less educated competent contractor as seen among some of the residential and remodeling trades as well as the very practical trades such as plasters and painters.

An education program accepted by the contruction industry as a requirement for relicensure appears to be unfeasible at the present time and it is the recommendation of the research that a program be instituted which will allow the contractor to remain current in the latest management, business, governmental, and technological changes if he so desires.

While recognizing that this is not a completely satisfactory answer to the continuing education of contractors, it is felt that the construction profession has, at this time, only reached a level where voluntary continuing education would be acceptable, whereas forced continuing education would lend to serious opposition from the construction industry.

CHAPTER 1
INTRODUCTION

Statement of the Problem

The United States construction industry presently suffers from the effects of technological and economic stagnation, while just two decades ago, this profession was the undisputed world leader. Since that period, American citizens have increased their spending by 13.2 billion dollars annually[1] to meet their increasing needs, demands, and desires. Despite society's continued spending, the construction industry's annual economic growth has declined to 4.2 percent in 1986 from 28.0 percent in 1966 (ref. App. R, p. 225). Americans consumed fewer "real" construction services in the 1980's versus the 1960's. The future could be potentially bleak for many construction establishments who take no precautions to ensure their survival. Predictions based upon historical trends are considered by many economists to lack sufficient justification. They speculate the future will always involve change, yet this study intends to soundly assert that no sole catalyst currently exists which could effect positive technological and economic restoration within the stagnated construction practices. The United States construction industry specifically lags in areas of technological advancement, innovation, and productivity in most construction fields. Stagnation is primarily the result of adversarial relationships and poor communication in many, if not most, fields of the design and construction professions. Litigation, not education, presently accounts for the foundation of our working interrelationships and communication. These in turn influence the advancement of all professions. Contractors, engineers, owners, and even the much maligned public are to blame for this deteriorating situation.

Changes in technological and economic climates typically create both major winners and losers. Attitudes toward change must be addressed, investigated, and overcome before we can benefit from future

1. total value (millions of dollars) = -25933089 + 13221 (year), information obtained from U.S. Bureau of the Census, *Construction Reports*, series C30.

innovation and advancements. The characteristics which dominate the construction industry in the United States, and hence Florida, are presented in Table 1. Construction businesses have been failing at a rate that was virtually unknown ten years ago. Figure 1 illustrates age at failure versus percent of failures for the construction industry. We could virtually end all risk by simply declaring a moratorium on innovation, change, and progress. Yet, it is known that human tastes, resources, and ambitions do not remain constant. The apparent, and presently most accepted, alternative for the construction industry is to respond by educating itself to prepare for incessant technological and economic change.

Table 1.
Characteristic Attitudes of Winners and Losers When Facing Change

winners	losers
Perception of change	
Eagerness to understand	Resistance to orderly change
Control of change	
Systems approach to management and budgeting	No central control for major policies, allowing inefficient reaction to change
Criteria for new investment	
Competitive advantage	Not market focused
Criteria for personal success	
Recognizing that mistakes do happen; rewarding sensible risk taking	Avoiding rocking the boat, and penalizing all mistakes
Long-term increase in market share	
Providing clients with designs that consider ease of operations and maintenance	Giving the client the minimum effort to meet contractual obligations (i.e., treating client as adversary)

Source: Perkowski, 1988, p. 575

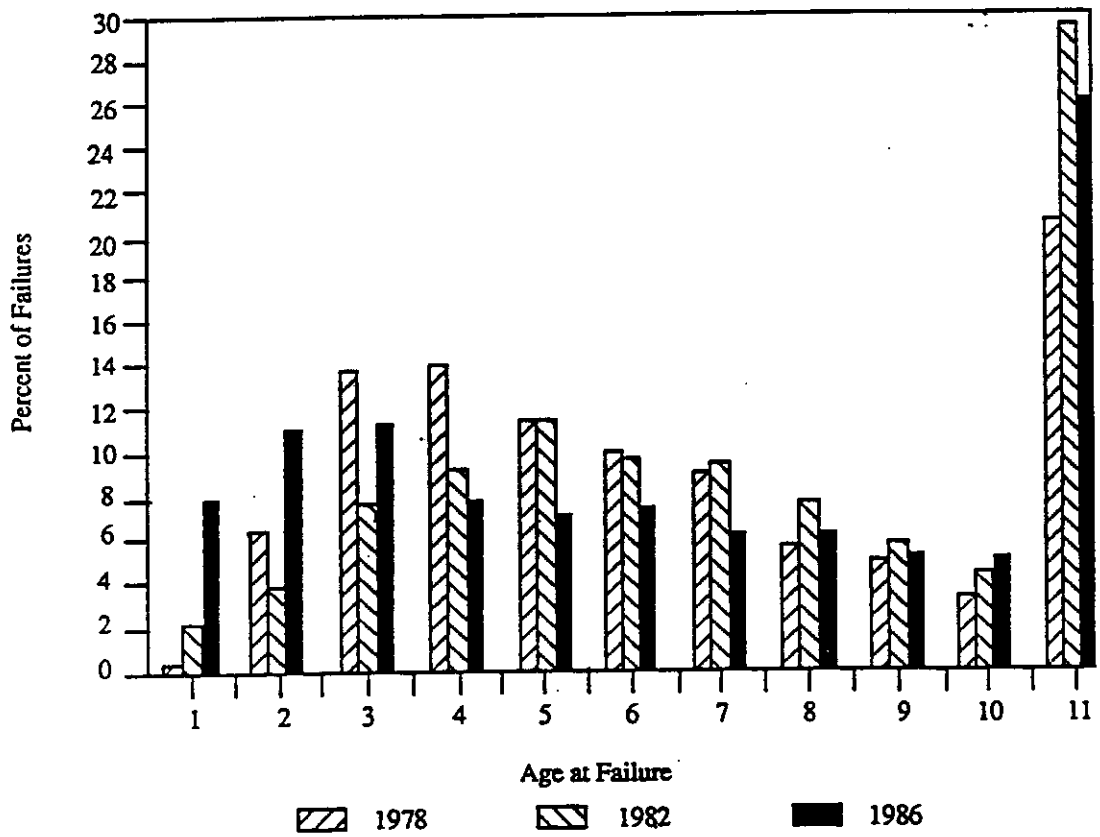

Figure 1. Age of Business at Failure, Construction Industry

Source: Dun & Bradstreet, 1986

Purpose of the Study

This study investigates the feasibility of implementing a continuing education program for licensed contractors in the state of Florida. If an educational program is not to be implemented, this study should assist professional associations and other concerned parties in serving the educational needs of the construction industry. Specific issues addressed in this study are outlined in Table 2. Due to complex interrelationships among objectives requiring multiple, varient discussion, a summary unique to each issue cannot be provided. Index-type references are, however, provided to pinpoint relevant discussion.

Table 2.
Objectives of the Study

number	objective	discussion
1.	Evaluate attitudes and characteristics toward continuing professional education for occupations in which practitioners presently participate as a prerequisite for relicensure.	Ch. 2: pp. 30-47
2.	Define critical conditions, activities and sources that have contributed to successful continuing education development operations.	Ch. 2: pp. 63-66
3.	Determine an administrative and marketing strategy for professional continuing education programs.	Ch. 2: pp. 61-63; Ch. 2: pp. 65-70
4.	Assess licensing requirements for contractors in the United States and for other regulated occupations within Florida.	Ch. 3: pp. 71-75
5.	Determine attitudes and motivational orientations of current construction practitioners towards continuing professional education.	Ch. 5: pp. 83-95; App. G: pp. 156-160
6.	Outline characteristics of construction-related education offerings currently assessable.	App. B: pp. 120-121; App. C: pp. 123-142; App. J: pp. 165-177
7.	Investigate the scope, orientation, content and cost of a plausible continuing professional education program.	Ch. 6: pp. 96-108; App. E: pp. 146-150; App. F: pp. 151-155; App. I: pp. 164
8.	Propose an education model with a sample activity based upon researched needs and attitudes.	Ch. 6: pp. 98-114; App. O: pp. 191-218; App. Q: pp. 223
9.	Provide recommendations for serving the educational needs of the construction industry.	Ch. 6: pp. 114-117

Table 3.
Benefits of the Study

number	benefit
1.	More effective protection of public health, safety, and welfare.
2.	More competent and better qualified contractors.
3.	Earlier, more efficient implementation of advanced management skills and new technology.
4.	Better dissemination and application of changes of codes and regulations.
5.	Increased construction productivity and more cost efficient construction.
6.	Fewer construction business failures and liabilities.
7.	Strengthened industry, government, and academic relations.
8.	Overall savings for the contractor, consumer, and the general public.
9.	Long-term government supervision and administration.

Application of the Study

Introduction

A profession that never has accidents is unlikely to be serving its country efficiently. Recent years have brought some of the most costly construction accidents in terms of human life, misery, and anxiety, so that the record presents a confusing image of technological and economic advancement that may cause some to ask, "Where is our progress?" "The success of another traditional design is no more news than the man who does not rob a bank or does not bite a dog. It is the anomaly that gets the press, and the abnormal that becomes the norm of conversation" (Petroski, 1982, p. 106). Nothing can erase a construction disaster, but no disaster need be repeated. By talking and writing about the mistakes that escape us we learn from them, and by learning we progress and can obviate their recurrence. Santayana (1920) believed that society must welcome the future, remembering that soon it will be the past; and we must respect the past, knowing that once it was all that was humanly possible.

Construction, engineering and architecture have their principal object not in the given world but in the world that they themselves create. Henry Petroski, professor of fracture mechanics and fatigue at Duke University, speaks of those characteristics which distinguish the created world from the real world.

> And that world does not have the constancy of a honeycomb's design, changeless through countless generations of honeybees, for human structures involve constant and rapid evolution. It is not simply that we like change for the sake of change, though some may say that is reason enough. It is that human tastes, resources, and ambitions do not stay constant. We humans like our structures to be as fashionable as our art; we like extravagance when we are well off, and we grudgingly economize when times are not so good. And we like bigger, taller, longer things in the way that honeybees do not or cannot. All of these extra-engineering considerations make the task of the engineer perhaps more exciting and certainly less routine than that of an insect. But this constant change also introduces many more aspects to the design and analysis of engineering structures than there are in the structures of unimproved nature, and constant change means that there are many more ways in which something can go wrong. (1982, p. 2)

Major construction trends noted in recent years include: increasingly larger and more complex projects resulting in greater risk; changing economic conditions; consumer demands for accountability and higher expectations; increasing application of computers and management information systems; wider use of performance specifications; increasing governmental regulations for protection of the public; and, higher costs and difficulties of financing. To be able to optimize economic, technological, and human efficiency within the

construction market, it is necessary for contractors to be aware of all new developments and apply them properly. For many contractors, it is essential for the survival of their business that they remain competitive through the application of new information and maintenance of previously established competencies.

The knowledge gap between professionals and consumers is being narrowed as more and more consumers are able to absorb information on any profession. The public is demanding technically competent, innovative practitioners. This is evidenced in the recent increase in malpractice suits and the trend toward consumer protectionism. Public disillusionment with the professions, consumer pressure for greater accountability, the growth of agencies regulating professional practice, feuding and fragmentation of professional associations, and jurisdictional disputes between and among professional and paraprofessional groups have all continued in parallel with continuing education's growth (Wolfson, Trebilcock, and Tuohy, 1980; Nowlen, 1988). State licensure agencies have and will continue to consider continuing professional education as a requirement for retention of licensure or certification. We are at the beginning of a period in which, with the knowledge explosion, more and more professionals will be pressured to keep up with the ability to apply new information. In order for them to do so, they are going to have to continue their education, whether the process is voluntary, conditional, or mandatory.'

An even more disturbing issue exists among practitioners themselves. Franklin and Goodwin (1983) found that practitioners felt that their major problems were external in nature. They believe their problems lie in the market and are therefore beyond their direct control. A committee of the U. S. House of Representatives investigated the construction industry in an attempt to prioritize factors which have negatively affected its market. While the Subcommittee on Science and Technology sought to identify factors that contribute significantly to the occurrence of failure, its report cites not the causes of failure but several significant factors deemed to be important in preventing construction failures. The findings of the committee consist of the following six critical factors in obviating failure:

1. Communications and organization in the construction industry.
2. Inspection of construction by the structural engineer.
3. General quality of design.
4. Structural connection design details and shop drawings.

5. Selection of architects and engineers.

6. Timely dissemination of technical data. (Petroski, 1982, p. 209)

Among some of the moderately significant factors were cost-cutting on design and construction, and among the least significant factors were the adequacy of the building codes and the impact of fast-track scheduling. Information and the transfer of information, communication, are the apparent factors for which adaptive assistance is desperately needed.

> Information is much more readily available and is changing the structure of corporations completely. Ten years ago a corporate structure looked like a pyramid, where information flowed up from a broad base. The whole structure has flattened out now, with fewer levels of organization. The result is the spreading of power. (McGowan, 1989, p. 57)

Professional continuing education, properly designed, is the only conceivable response to better assist the practitioner in transferring necessary information into performance. The construction industry shall forever have beneficial contributions to society, remain profitable to some degree, and provide a tremendous number of jobs. Is the belief in improved communication alone adequate consideration of public interest? Business establishments must address social issues – if only because continued social decay or stagnation will not be good for business or for other living things. To summarize the present situation, there is plenty of work to be done in all of the construction and design professions.

The effects of failure can be measured not only in terms of first, second, or third party lives, but they are also felt in the economic strain placed on our society. The National Bureau of Standards estimated that structural failures alone cost well over $100 billion annually. The 1983 report further concluded corrective expenditures could be reduced one-half by better utilizing available technology and by adopting improved techniques expected from research and development. Practitioners must realize all designs are in some degree failures because they are compromises, and compromise implies a degree of failure. Therefore, they must incorporate those developments and improvements which impact their practice to obviate all failure, whether it be structural, economic, or human.

Business Environment

Society has lived through the entrepreneurial boom of the 1980s, which, although not expected to increase in the coming 1990s, shall continue its current high level. Many business markets experienced

destabilization through a large and widely spread rise in competition to where the underlying structure of the U.S. economy has significantly shifted. "Entrepreneurship was a cause as well as an effect of increased competition" (Case, 1989, p. 33). The *Fortune* 500's share of the gross national product has decreased 15 percent in the last ten years and now accounts for less than 11 percent of the civilian labor force (Reich, 1989). The American small businessman has turned his company into an effective tool to bring about attitudinal deviation, specifically, that of pro-competition, pro-entry, and pro-choice within all business markets:

> What has struck me is the growing respectability of business, particularly *INC.* - size businesses. Ten years ago if people thought about trying to effect change in society, they thought about working for institutions or government — not business. (Kanter, 1989, p. 63)

Society, however, may not realize that construction firms are susceptible to similar ailings prominent in other business entities – failure. Not only must the consumer be concerned with the selection of a competent practitioner, he need also be concerned with the construction establishment's survival to perform all work contracted for and to guarantee any applicable long-term warranties. Establishments employing fewer than 20 people have only a 37 percent chance of survival during their first four years (U.S. Small Business Administration, 1982). On the average, the construction industry in Florida maintained fewer than ten employees per establishment during 1985. Only three of more than twenty industry classifications employ over 20 people (ref., Tab. 4, p. 9). Of the 15 million companies operating in the U.S. today, most (86.0 %) employ fewer than 20 people (Grosse, 1989). Table 4 illustrates this extremely small organizational size for construction establishments in Florida. Since the late 1960s, Dun & Bradstreet has reported business failures within the United States to be somewhere in the neighborhood of 10,000 firms per year "Nationally, for every three businesses formed, about two businesses close their doors" (U. S. Small Business Administration, 1983, p. 148). Figure 2 shows that the construction failure index and the failure rate index for all business failures have become staggering. In 1986, for every five businesses which failed, the construction industry lost one more than the national average. Should society selectively promote the survival of the construction profession over other professions?

The construction industry is fragmented, very sensitive to economic cycles, and highly competitive because of the large number of firms and the relative ease of entry. Figure 3 shows the relative influence of 10 major origins affecting a construction business' failure. *The Business Failure Record*, a publication prepared

Table 4.
Construction: Reporting Units, Employment, and Average Number of Employees by Industry in Florida, March 1985

industry	number of reporting units	number of employees	average number of employees per establishment
Construction	34,553	335,229	9.7
Building Construction--General Contractors and Operative Builders	10,543	91,297	8.7
General Building Contractors--Residential Buildings	7,830	51,531	6.6
Operative Builders	528	6,587	12.5
General Building Contractors--Nonresidential Buildings	2,185	33,179	15.2
Construction Other than Building Construction--General Contractors	2,579	52,679	20.4
Highway and Street Construction, Except Elevated Highways	698	19,212	27.5
Heavy Construction, Except Highway and Street Construction	1,881	33,467	17.8
Bridge, Tunnel, and Elevated Highway Construction	52	2,079	40.0
Water, Sewer, Pipe Line, Communication, and Power Line Construction	617	15,068	24.4
Heavy Construction, Not Elsewhere Classified	1,212	16,320	13.5
Special Trade Contractors	21,431	191,253	8.9
Plumbing, Heating (Except Electric), and Air Conditioning	4,173	42,562	10.2
Painting, Paper Hanging, and Decorating	1,882	11,487	6.1
Electrical Work	3,202	37,454	11.7
Masonry, Stonework, Tile Setting, and Plastering	3,587	34,405	9.6
Carpentering and Flooring	2,034	11,235	5.5
Roofing and Sheet Metal Work	1,577	13,977	8.9
Concrete Work	1,178	10,122	8.6
Water Well Drilling	229	1,124	4.9
Miscellaneous Special Trade Contractors	3,569	28,887	8.1
Structural Steel Erection	393	5,438	13.8
Glass and Glazing Work	352	2,682	7.6
Excavating and Foundation Work	351	2,999	8.5
Wrecking and Demolition Work	22	201	9.1
Installation or Erection of Building Equipment, Not Elsewhere Classified	170	2,671	15.7
Special Trade Contractors, Not Elsewhere Classified	2,281	14,896	6.5

Source: University of Florida, Bureau of Economic and Business Research, College of Business Administration, 1986

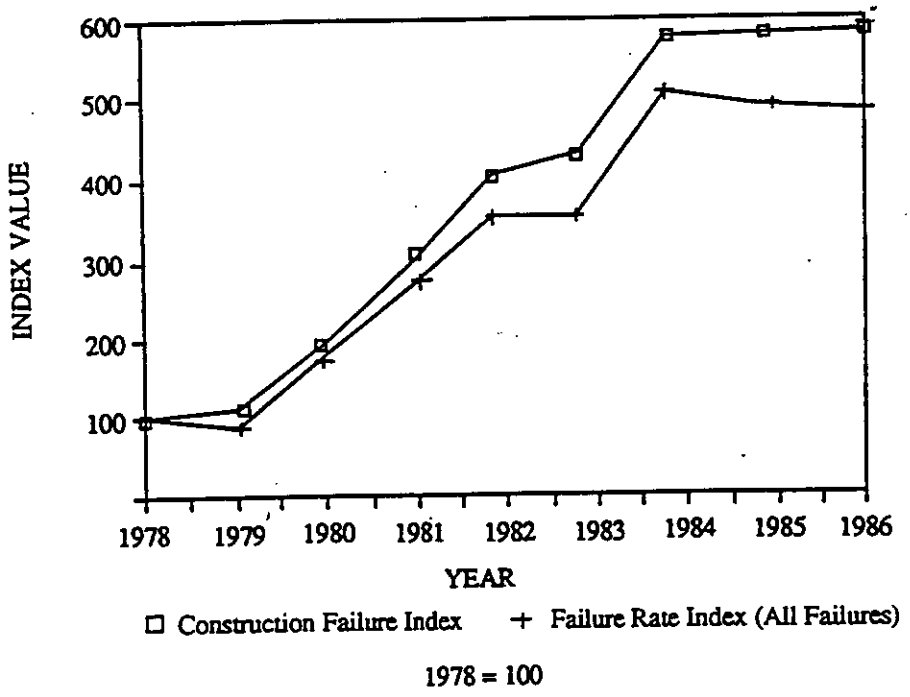

Figure 2. Failure Index Versus Failure-Rate Index

Source: Dun & Bradstreet, 1986

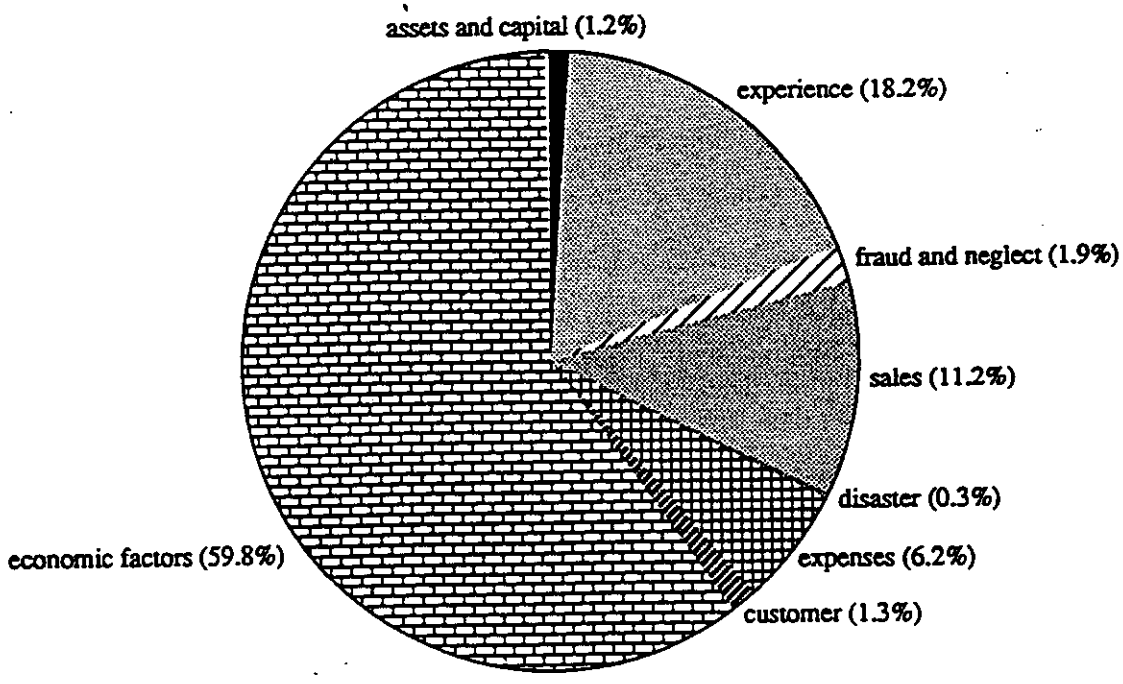

Figure 3. Causes of Construction Business Failures

Source: Dun & Bradstreet, 1986

by Dun and Bradstreet (1981) indicates that 92 percent of all business failures are because of poor management. They conclude the top four reasons for managerial failure are: (1) nonsufficient profits; (2) management incompetence and lack of experience; (3) inadequate sales; and, (4) loss of market and economic decline. Kline, Stegall and Steinmetz (1982) are even more specific and cite the following areas of incompetency that generally lead to failure:

1. Poor record keeping, which includes both imprecise accounting systems as well as an understanding of the financial information derived from the system.

2. Poor cash management to include under-capitalization and a failure to prepare a cash flow projection.

3. Failure to plan, and thus take advantage of opportunities as they arise and head off management difficulties before they become too serious.

4. Inattention to marketing — sales are the secret to success in any business venture. An objective analysis of the firm's products, its present market effort and the genuine needs of customers must be a continual process.

5. Ignoring the human factors. Too many entrepreneurs spend all their time worrying about production and solve personnel problems on a crisis basis.

6. Failure to assume the proper role. As the firm grows to new stages of development, the entrepreneur must adapt his/her role to the changing situation.

If the operation of a construction business is so hazardous and failure rates and reasons are so predictable, why are more owners or potential owners neglecting available assistance? The consequences of a particular market failure, regulation, or restriction not the considerations that led to the present situation, should inform our judgement. "The federal government may eventually be forced to intervene, as it has so often in the past, when the private sector of the economy has failed to uphold its social responsibilities" (Shimberg, Esser and Kruger, 1973, p. 123). Schuck (1979, p. 39) believes:

> We should not permit our skepticism concerning the motivations and consequences of professional licensure to blind us to potential benefits. We ought to restrain some of our righteous indignation . . . and try instead to evaluate particular restrictions by studying their effects on competition and on other values. It is easier to attack licensure in other professions than to ensure that the restrictions imposed by one's own do ensure minimum levels of competence.

Public Interest

Public interest arguments in support of regulation should be made in terms of generally accepted social principles. There have been varied efforts by state groups to raise a profession's standards (e.g., making education and training requirements more stringent, making the experience requirement longer, and making examinations more rigorous). The justification for higher standards is always said to be the public's interest, yet, it often cannot be proven that the public was actually harmed by earlier standards.

The principle argument for licensing contractors is the protection of the public health and welfare. It is said that consumers sometimes face difficulty making rational choices because they lack information on the quality of available goods or services before purchase. A consumer's purchase of a construction service is infrequent at best and costs a sizable portion of the typical consumer's income. For example, recent homebuyers have spent as much as 35.5 percent of their income as an average monthly mortgage payment (U. S. Bureau of the Census, 1986). Serious and long-lasting damages will occur if the service is of poor quality. Roughly 50 percent of consumer complaints concern willful disregard of plans or specifications; willful violation of building codes; willful project delay causing economic or social injury; failure to complete the project for the contracted price; and, abandonment of a project without cause (Maurizi, 1980). If it is difficult for the consumer to recover damages suffered at the hands of an incompetent practitioner, avoiding these damages is worth the higher prices which accompany licensing to prevent such transactions from occurring. Defects should be eliminated altogether, no failures can occur when an environment concerns public safety. One can visualize the need for individuals involved in construction to be experienced, to possess at least a minimum competence, and to demonstrate familiarity with the requirements established by relevant regulations and codes. The objective of occupational licensing is to raise the average level of quality by eliminating the unethical, low-quality incompetent practitioner.

A discussion of the public interest provides some guidelines for selecting among the various regulatory options available to policy makers. Before a choice of regulatory actions is considered, it must first be determined that some intervention is required. No single list of the causes of failure or of lessons to be drawn from them is likely to satisfy consumers, practitioners, third parties, and state agencies alike. Hence, all such corrective attempts may be doomed to failure themselves; yet, it remains that the rationale for regulatory intervention must lie in the belief that unregulated activities have failed to achieve social objectives. "The

failure of markets to achieve the social objective of economic efficiency in the allocation of factors and products (services) forms a prima facie for regulatory intervention" (Wolfson, et al., 1980, p.189). Five reasons why markets might fail include (1) concentrations of economic power on the supply side or the demand side; (2) barriers to free entry and exit from the market; (3) services sold in the market may not be homogeneous; (4) complete information about the nature and value of the services sold may not be available to all consumers and producers; and, (5) there may be externalities in the production or consumption of the services (Wolfson, et al., 1980). Of the prior list, only two sources of market failure differentiate the construction market from many other markets and may call for special regulatory intervention: serious informational problems; and, pervasive externalities.

The first issue is whether consumers have or can obtain enough information to accurately assess the benefits of professional services. It should not be important to the market's operation that consumers be knowledgeable about the nature of the professional production process itself and the technicalities involved therein. The consumer is authorizing the professional to act on his behalf, and must therefore trust his agent to take his interest fully into account. It would follow that practitioners should not claim that they are specialists while the public insists on their retaining licenses which label them as generalists. Professionalism involves applying of a general system of knowledge to the circumstances of a particular case. Many (e.g., Shimberg et al., 1973, Schuck, 1979, Loweathal, 1981, and Rizzuto, 1984) characterize a profession as a well defined body of knowledge, containing basic principles common to all applications and techniques unique and to the field, with practitioners skilled and experienced in applying these techniques, dedicated to the public interest. To effectively and efficiently serve both the consumer and society, Wolfson, et al. (1980) state that general knowledge is necessary to

1. Identify the precise nature of the problem (diagnosis).

2. Determine the best way of dealing with it (prescription).

3. Provide specialized services so as to solve the problem (therapy). (p. 190)

Professional ethics typically focus on the practitioner's obligation to promote his clients' interest as determined by the benefits to be derived from recommended courses of action. "The relationship between professionals and consumers cannot work satisfactorily if practitioners are not self-disciplined. It is hard to

overemphasize the importance of the socialization process inherent in professional education and reinforced by professional norms" (Wolfson, et al., p. 192). This trust relationship disregards the full operation of market forces, and market forces may undercut trust relationships. This can best be seen in an economic constraint which is often imposed by demands within the marketplace. Society tends to drive the market to minimize the cost of construction services purchased. As successes mount, the questions come from society, from taxpayers, from government, and from practitioners themselves as to how much larger, how much lighter, and how much more economically the next structure can be made (Petroski, 1982). In making all parts as efficient as possible there is little room for error in the computer's computations for the design, in the manufacturer's production of materials, or in the construction worker's execution of the design.

Success will ultimately lead to failure. Support for this belief rests in trying and implementing principles of design and safety, and of risk and benefit, which are relatively new. It is not necessary that consumers familiarize themselves with these principles; it is only necessary that they be able to judge the value of the services offered on the market. There exists an assumption of competence, in that the market should have instilled all necessary competencies necessary for the practitioner to operate. Any potential or incentive for the imperfect functioning of the agency relationship could call for a regulatory response. In the absence of government intervention, it may be unrealistic to expect much more of contractors than of entrepreneurs in general.

The design professions do not appear to have as serious an information problem as do the construction practices. This lies in existing licensing laws which ensure minimum education and competence levels for the professional who performs the design. However, in both the design and construction professions, neighborhood effects are evident. The potential effects of a poor design or construction on public health and safety are dramatic; as such, externalities of this kind necessitate a regulatory response. Safety is ultimately more important than either the economic or aesthetic objectives, for the loss of a single life "can turn the most economically promising structure into the most costly and can make the most beautiful one ugly" (Petroski, 1982, p. 41). It is because construction fatalities do not occur one or two at a time that they create a sensational impact on the public.

In the construction industry, unlike other industries, benefits accrue to more than the direct purchaser of services. "If these third party interests are not introduced into the decision making process, the societal

consumption of these goods and services would be less than optimal" (Wolfson, et al., 1980, p.193). Government intervention is the only consistent method in which third party interests can be accounted for within any marketplace. However, because government administrations value their fiscal and political health as well as the lives of their citizens, these objectives can sometimes be in conflict (Petroski, 1982). Petroski further speaks on the issue of public safety in that:

> All bridges and buildings could be built ten times as strong as they presently are, but at a tremendous increase in cost, whether financed by taxes or private investment. And, it would be argued, why ten times stronger? Since so few bridges and buildings collapse now, surely ten times stronger would be structural overkill. (1982, p. 6)

Can this predicament be approached the way a manufacturer might where public safety is not a concern? Could the design and construction professions perform itterative processes to produce safe products at a reasonable price? Market failures of this kind provide the greatest support for a regulatory intervention. Discussions of the need for regulation to protect the public interest are often based on concerns for third party effects rather than the protection of the clients themselves.

Public interest is not in itself a substantative concept that should guide policy determination. "It is a signal for a particular kind of political debate in which all relevant interests are taken into account and in which certain general principles dominate" (Wolfson, et al., 1980, p. 213). Ethically, professionals are required to take into account not only the interests of their clients but the legitimate interests of third parties who may also be affected by the decisions they make on their clients' behalf. Every contractor, every engineer, and every architect must conform to certain principles which have been determined to be fair, efficient, accountable, and practical to all relevant parties.

Conclusion

Siropolis (1982) feels that the solution to existing problems within any market is preparing the practitioner for change through education. He maintains that our economy is likely to continue to become increasingly more scientific and therefore more complex. The normalcy once enjoyed in many professions is disappearing. Practices as well as products and services will become obsolete and those who intend to survive will have to better prepare themselves to master change. The construction industry cannot advance beyond its

present stage of development if one generation simply passes on what it has learned through experience to the next generation of practitioners. Cross (1982, p. 110) points to a clear lack of theory and warns that:

> Such an approach results in a static, if not downright stagnant, profession, because each new generation of professionals simply catches up with the preceding generation rather than forging new frontiers of knowledge. The systematic accumulation of knowledge is essential for progress in any profession. In an applied profession, however, theory and practice must be constantly interactive. Theory without practice is empty, and practice without theory is blind.

As to who should provide assistance, practitioners as well as researchers appear to have mixed feelings on this topic. Universities and professional associations tend toward the relative impact on the professions and their clients of new information, legislation, conceptual frameworks, skills, procedures, and technology. Practitioners, on the other hand, are more concerned with the relative difference the conference, seminar, or course is likely to make in their professional practice, agency, or organization. (Nowlen, 1988) There seems to be some indication that universities and colleges have recently been doing more to provide assistance (Sotrines, 1984). Although many accessible sources do exist from which to seek assistance, most believe that they must be actively sought by the practitioner and evaluated in order to be beneficial.

The present status of professional education is pointed out by McGlothlin (1960), Miller (1976), and Mayhew and Ford (1974) who predict the following future developments:

1. The demands of society for professionally educated persons will continue to increase but these demands cannot be met without substantial change in professional educational programs.
2. The professions as now organized will continue with such modification as occurs coming through evolution rather than through cataclysmic change.
3. The knowledge on which practice of the professions is based will continue to expand.
4. The knowledge and skill required for practice of a profession are too complex to be transmitted by apprenticeship.
5. Professional education can satisfy both occupational and general aims. It can help students to obtain knowledge and skills required by professional practice and to develop appropriate attitudes towards a sense of professional commitment.

Can practitioners run the risk of compromising the safety and welfare of the public? If only one designer or one contractor acquires new skills or knowledge from a professional education activity that enables him to catch a flaw in his own project, the activity has contributed to public welfare as surely as do building

codes, design codes, failure archives, or even legislation. For all of the industry's efforts are to make something stand that has not stood before, and above all to obviate failure in it's effort. In the long run, any investment in the pursuit and excellence of educational opportunities for the practitioner would act like a stone dropped in a pool of water: "It starts waves of social and economic benefits which radiate in ever widening circles, touching the lives of more and more people as the results of excellence in education manifest themselves in the years to come" (Jones, 1979, p. 80).

Research Procedure and Methodology

Major issues cannot be resolved by a single study. It is the cumulation of knowledge from the results of many studies which form the foundation for advancement of all professions. As previously stated, the purpose of this study is twofold: (1) to investigate the implementation by state authority of professional continuing education as a condition for relicensure, and (2) to serve as a guideline for professional associations in meeting the educational needs of the construction industry. This study has integrated findings of many studies in order to satisfy the proposed research objectives.

An attempt was made to acquire all post-1980 studies on the subject of professional continuing education. Recent studies were employed to ensure the reflection of current attitudes and trends in professional markets. The acquisition of these studies was achieved through the use of document retrieval systems. Once the studies identified by the system were acquired, an examination of their bibliographies and references was carried out in order to reveal additional literature. Additionally, the *Encyclopedia of Associations* was used to obtain information from national professional associations with direct and indirect ties to the construction industry. Both qualitative and quantitative information obtained from the literature search and the national associations were integrated in the study and formatted in response to the study's principal objectives.

A survey questionnaire was designed and distributed to determine the needs and attitudes of state-licensed contractors within the state of Florida. A sample size of one thousand was chosen with a stratified distribution among all regulated licensed fields. The data was then analyzed and presented in quantitative terms with selected results compared to those of prior studies presented in Chapter 2 where applicable. By integrating other research studies within this study, both a theoretical and practical foundation for implementing a competence-based professional continuing education program for licensed contractors have been constructed.

Definition of Terms

Attitude denotes "a disposition that is primarily grounded in affect and emotion and is expressive in opinions" (Babcock, 1967, p. 40).

Certification is "recognition by a professional organization or an independent external agency of the competencies of individual practitioners" (Bratton, 1984, p. 12).

Competence means "the ability to carry out a specific task or tasks according to predetermined standards of performance" (Rizzuto, 1982, p. 38).

Continuing education denotes "an educational program designed to update the knowledge and skills of its participants" (Babcock, 1976, p. 288), "as distinct from graduate education, continuing education courses tend to be more specific, of generally shorter duration, and may result in certificates of completion or specialization, but not in formal degree" (Rizzuto, 1982, p. 38).

Continuing education unit is "ten contact hours of participation in an organized continuing education experience under responsible, capable direction, and qualified instruction" (Cooper, 1981, p. 73).

Continuing professional education is "education and training beyond the basic professional degree of license" (Lowenthal, 1981, p. 519).

Critical characteristics are "the distinguishing features, traits of qualities that are necessary for a continuing education operation to reach its stated goals and objectives for fund raising and friend raising" (Millner, 1986, p. 6).

Critical conditions denote "the internal and external factors that are necessary for a continuing education development operation to reach its stated goals for fund raising and friend raising" (Millner, 1986, p. 6).

Critical development activities are "the fund raising and friend raising activities that are necessary for a development operation to reach its stated goals and objectives for raising money and friends" (Millner, 1986, p. 6).

Development means "the process of conducting friend raising and fund raising activities" (Millner, 1986, p. 7).

Grandfathering denotes "the process of allowing experienced individuals to receive certification status without requiring them to engage in the activities required for certification and/or meet the standard qualifications of applicants" (Gilley, 1985, p. 4).

Licensure is "mandatory legal requirements for certain professions, enforced by a governmental body, for the protection of the public from incompetent practitioners" (Bratton, 1984 b, p. 13).

Mandatory continuing education means "the continuing education requirement necessary for relicensure or certification or recertification" (Sasmor, 1979, p. 33).

Model denotes "a miniature representation of a program that helps explain a phenomenon by pointing out its essential characteristics" (Gilley, 1985, p. 4) and "is put forward as a basis for calculations, predictions, or further investigation" (Burchfield, 1976, p. 990).

Professional association means "an organization of individuals with a common interest in advancing the profession and individual skills of its members" (Gilley, 1985, p. 5).

Small business denotes "a business employing less than 500 people and not exceeding the U. S. Small Business Administration industry limits for annual receipts" (Sotrines, 1984, p. 8).

Organization of the Study

The study consists of six chapters. The purpose of the first chapter is to introduce and state the problem under investigation. Chapter 1 includes a statement of the problem, purpose of the study, application of the study, research procedure and methodology, definition of terms, and organization of the study. Chapter 1 also outlines the study's primary objectives and benefits.

The remaining chapters of the study are

2 Review of Related Theory and Research

3 Regulation of the Professions

4 Methods and Procedures of Analysis

5 Analysis and Interpretation of Data

6 Conclusion

CHAPTER 2
REVIEW OF RELATED THEORY AND RESEARCH

Introduction

A review of the literature on continuing professional education (CPE), uncovers a wealth of information. The literature search, however, produced no published research studies pertaining to professional continuing education for the construction and design professions. Very few studies were retrieved pertaining to the outcomes of mandatory CPE. Studies looking at the effects on professional practice given voluntary, as contrasted with mandatory, CPE are simply not available. To date, the bulk of research on continuing education has concentrated on the collection of attitudinal and demographic data. This study follows the format of other research in the field of continuing professional education only because no studies have been performed collecting data on attitudinal and educational CPE needs for the construction industry. Information presented in this chapter shall be further discussed in Chapter 6 with specific data collected from state-certified contractors in the state of Florida.

The following topics were identified as being relevant for a comprehensive understanding of the issues surrounding mandatory continuing professional education and for potential implementation into Florida's regulatory statutes:

Options for professional regulation
Overview of continuing professional education
Overview of mandatory continuing professional education
Continuing education models
Evaluation of continuing professional education courses
Continuing professional education operations

Options for Professional Regulation

Prediction is always a risky business. Nevertheless, two trends are sufficiently apparent to warrant consideration of their impact on regulation between now and the year 2000. These are developments in technology, specifically computerization, and in ideology, specifically antiauthoritarian and egalitarian attitudes. The interaction of these factors can spell a future in which acceptance of professional self-regulation would be on the decline and more formal external social controls would be a real possibility. Only during the past decade have the professions, regulatory agencies, and the general public begun to seriously question licensure for life. Historically, licensing boards have functioned with considerable autonomy without the normal checks and balances found in government organizations. Now, whatever changes may be undertaken in specific requirements for given professions, i.e., reduction, expansion, subject matter, methods, lie in the political arena where lobbyists for public interests, for professionals in their organizations, or for dissident professionals, argue their case before licensing boards. There are no easy solutions and readily accepted mechanisms in place at present. With the recent upsurge in mandatory continuing education and maintenance of competence, regulatory boards have developed a new interest in the already licensed professional. A brief review of the available principal regulatory strategies is essential in assessing the strengths and weaknesses of continuing education.

While this chapter focuses primarily on the broad issues relating to the need for increased regulation through mandating continuing education, it recognizes the tendency to jump to regulation without adequately considering alternative public or private responses to a problem. Problems of quality in professional markets center on the relationship between the nature of services provided and the outcomes of those services. Consumers may not be sufficiently knowledgeable to determine what quality of service they need. Services of proper quality are those that are appropriate as measured by client and third party interests and that are well performed. Quality can be controlled by regulating either the services produced or the producers of services, the outputs or the inputs of professional markets. Presently, a combination of both methods is employed to regulate the construction industry through minimal quality standards established in building and design codes and occupational licensing. A brief commentary on existing output and input regulatory strategies follows.

Output Regulation

Probably the least interventionist and longest established response to quality breakdowns in professional markets is the civil liability suit to combat professional negligence. The standard to which the contractor will be held is the standard of competence and care that generally prevails throughout his field in question. If either the purchaser of the services or a third party suffers damages as a result of the contractor's failure to adhere to the accepted professional standard, the injured party will receive compensation for any damages incurred.

The advantages of such a system for responding to quality control problems include

1. It keys on outcomes, in the sense that liability ensues if a service fails to achieve the purpose that it was reasonably intended to serve as a result of negligence in its provision. Obviously, the interest of a client in professional services that he has purchased is, ultimately, in the outcome of such services, and civil liability systems address that question directly and explicitly.

2. It constitutes an external constraint on professional behavior inasmuch as suits for its enforcement are initiated by parties external to the profession, and it is adjudicated by an agency external to the profession.

3. It simultaneously achieves both compensation and deterrence. To the extent that civil liability fully compensates victims for damage sustained as a result of professional negligence, the victims become indifferent to poor quality service. To the extent that the negligent provider is required to face full social costs he has inflicted on other parties, he will have incentives to provide a quality of service that will avoid these social costs.

4. It is dynamic in the sense that the standard of quality demanded shifts over time to reflect changes in norms and procedures in a profession. (Wolfson, et al., 1980, p. 199)

These strengths presently exist in many professional markets and have provided needed assistance to overcome quality problems. However, this system remains afflicted with a number of problems which themselves are not trivial:

1. The injured party may have difficulty obtaining the services of a second expert. Here the collectivization of professional values may tend to manifest itself in a conspiracy of silence.

2. The problems associated with uninformed clients may be compounded by the dependence of the system on inexpert adjudicators. In short, the probability of error in determinations of competence may be quite high.

3. The system is costly to administer because of the difficult technical determinations required case by case.

4. In many contexts, the system will not compensate or deter. As a matter of equity, there is a serious defect in a system that permits sudden, drastic losses that are not fully compensable to fall unevenly on relatively few people. Moreover, the system will not achieve an optimal level of deterrence if victims, through ignorance, do not sue for incompetence or, because of the costs of bringing suit, are deterred from doing so. (Wolfson, et al., 1980, p. 200)

The construction market is not one where clients and third parties are relatively well informed. Numerous third parties are at jeopardy and costs entailed in multiple lawsuits have historically been extremely high and time-consuming. Additionally, there is no lay involvement in the process, and none appears to be contemplated. If decisions about guilt or innocence can be made by a lay jury in a criminal trial, or about appropriate compensations in a civil suit, why can a lay group not evaluate evidence concerning a professional's behavior or performance? As a result, civil liability should be assigned no more than a secondary role in assuring professional competence within the construction industry.

Mandating continuing education for the construction trades would have the effect of assuring those standards to which the provider will be held accountable are consistent, accepted, and known by all providers. This would positively influence the secondary role of civil liability through the awareness of accepted professional competencies throughout the industry. The objective of making the civil liability approach more efficient and effective will have been indirectly accomplished.

A second form of regulating professional output is by establishing standards of performance and monitoring or reviewing activities to ensure that they conform to those standards. In building design and construction, building codes and planning acts often confer extensive municipal powers to prescribe structural, fire safety, life safety, aesthetic, and many other standards. This type of output regulation is more heavily relied upon within the construction industry than in all other professional markets. A specialized governmental agency is vested with authority to develop and enforce detailed norms of standards and behavior. In theory, one could regulate quality in a professional market solely through standard setting and enforcement, thus entailing free entry into a professional market and, where justified, enforced exit from it.

There are certain advantages to this form of intervention in professional markets:

1. Standard setting and enforcement key directly on outputs, which are closer than inputs to the ultimate interest — the outcome.

2. A disciplinary body can bring a great deal of highly specialized expertise to bear on developing and enforcing standards of conduct and performance.

3. An expert agency is not afflicted with the lack of information and expertise besetting the individual client-victim contemplating a civil liability suit.

4. To the extent that the standards are specified and enforced through a collegial agency within a profession, the credibility of the process may be heightened and self-adherence to the norms promoted, thus reducing enforcement costs. (Wolfson, et al., 1980, p. 202)

However appeasing this approach may appear, standard setting and enforcement suffer from some disabling problems:

1. The process of monitoring and review is highly individualized and involves costly determinations of difficult factual and technical issues case by case.

2. Where the enforcement agency is a profession's disciplinary body, the sanctions available to it are generally crude, and it is not easy to make the provider weigh the social costs of incompetence and the social costs of avoiding it and select the smaller. The disciplinary process is unlikely to confront a provider with both sets of costs with any degree of accuracy.

3. To the extent that administrative regulation of outputs involves standard setting, there is a danger that excessive rigidities may constrain innovation. (Wolfson, et al., 1980, p. 202)

This approach is presently the most effective in protecting the interests of third parties. Mandating continuing education would ensure that the licensed contractor has been exposed to current standards and regulations intended to protect the general public welfare.

Input Regulation

If judicial regulation and administrative regulation of outputs are thought to be inadequate guarantors of service quality, the broad alternative is input regulation. In all professional markets, the two basic forms of input regulation available are certification and licensing. With certification, some authority or agency is empowered by statute to certify individuals to the public as having satisfied particular educational and training requirements to indicate competence in a particular range of professional services. Jacobs (1979) believed professional certification programs are growing because they:

1. Provide prestige, recognition and earning power for the individual.
2. Enable the public to distinguish between those that have attained some qualifying level of competency from those who have not.
3. Encourage and recognize higher professional achievement. (p. 3)

Professionalism is a principal motivation for certification because the development of a profession generally requires that an entry-level requirement be instituted. Professional certification has been recognized as an acceptable evaluation device to measure competencies and entry requirements (Gilley, 1985). However, uncertified individuals are not legally prevented from offering services in competition with certified individuals. In contrast, with licensing, only individuals licensed after attaining prescribed educational and training standards are legally permitted to offer the relevant services. Table 5 contains construction-related professional associations who responded to our information request that maintain certification programs and offer continuing education to its members and other non-members.

Professional association certification programs contain essential requirements that must be successfully completed prior to the awarding of certificates (e.g., Galey, 1980; Weiss and Young, 1981; Westgaard, 1982; Venable and Gilley, 1984). Westgaard (1983) maintained that the following certification criteria are generally used to insure competence:

1. Graduate from an accredited training program.
2. Pass a proficiency test.
3. Serve an internship.
4. Develop a portfolio documenting achievement.
5. Be recommended by a practicing professional. (p. 4)

The primary purpose of both accreditation and certification is to focus favorable attention upon the competent institutional program and individual practitioners. While persons within the professions under licensure cannot practice without a license, associations can function without accreditation and persons within certified professions can practice without the certificate (Gilley, 1985).

Table 5.
Professional Associations and
Summary of Their Offerings

name	a	b	c
American Management Association	N	N	Y
Post Tensioning Institute	N	N	Y
Professional Women in Construction	N	N	Y
Construction Specifications Institute	Y	Y	Y
National Association of Plumbing, Heating and Cooling Contractors	N	N	Y
Mechanical Contractors Association of America	N	Y	Y
Construction Financial Management Association	N	Y	Y
International Conference of Building Officials	Y	Y	Y
National Conference of States on Building Codes and Standards, Inc.	N	N	Y
Institute of Industrial Engineers	N	Y	Y
National Constructors Association	N	N	Y
The American Society of Mechanical Engineers	N	Y	Y
National Association of Corrosion Engineers	Y	Y	Y
National Association of Home Builders	Y	Y	Y
Florida Engineering Society	Y	Y	N
The Associated General Contractors of America	N	Y	Y
American Society of Civil Engineers	N	Y	Y
Administrative Management Society	Y	N	Y
American Society of Testing and Materials	N	Y	Y
National Fire Protection Association	N	Y	Y

a - Offers Certification
b - Offers Continuing Education
c - Offers Other (Publications, Conferences, etc.)

Source: Information obtained from national professional associations

The apparent strengths of a certification system include

1. It responds to the problem faced by an uninformed public trying to determine competence.

2. It is relatively flexible. While it attempts to segregate providers in a market by informing consumers about relative degrees of competence, it nevertheless preserves free entry into the market.

3. Certification systems permit competing and parallel certificates to be offered by a number of rival organizations, which would create strong economic incentives for each organization to police the competence and conduct of its members to enhance the credibility of its own certificates.

4. In markets characterized by quality uncertainty, high-quality providers may be driven out unless there is a means of enabling them to differentiate their product or services and obtain appropriate rewards for superiority. Certification may prevent the degeneration of such a market. (Wolfson, et al., 1980, pp. 203-204).

Despite such strengths, a certification system also exhibits a number of significant weaknesses:

1. They make large (often heroic) assumptions about quality about correlation between inputs and outputs. They assume that by prescribing a given set of educational and other inputs as a condition for certification or licensing, we can be assured of the provider's ability to furnish us with the desired quality of service forever after.

2. The problem is that, to some extent, all certification schemes are inherently misleading; they can never tell a consumer what, precisely, a provider is certified as competent to do, or how well.

3. In markets where the costs of error in the provision of a professional service are high, certification may not be a sufficient guarantee of service quality.

4. Certification systems do not address third-party effects. Essentially, they leave it open to consumers to retain uncertified providers, assuming whatever risks are inherent in this, both to themselves and to third parties.

5. Financial support is viewed as a two-edged sword. The credentialing organizations need some financial assistance to support the administration of a program. The other edge of the sword is the expectation of the parent organization's privilege for influencing the certification program (Miller, 1976, p. 38; Wolfson, Trebilcock, Tuohy, 1980, p. 205).

Adoption of a certification program should include continuing requirements. Recertification is important because "pride of accomplishment can be a powerful motivation of recertification. But the real payoff of maintaining certification is consumer awareness" (Hollenkamp, 1984, p. 2). Gilley (1984) believed that recertification advocates continuous professional development and is an essential element in the certification process. Mandating continuing education requirements for recertification is not unreasonably restricting and overcomes the sensitive issue of grandfathering.

Where one option is to certify providers by ensuring that certain qualifications are met before a provider can identify himself by a restricted designation, the other option is to license providers. This prohibits unqualified practitioners from offering services altogether rather than prohibiting them from calling themselves qualified. Again, the objective is to influence, through regulation, the outcome of the professional's services. Licensing is "the process whereby an agency of government grants permission to persons to engage in a given profession or occupation by certifying that those licensed have attained the minimal degree of competence necessary to ensure the public health, safety and welfare" (Sasmor, 1979, p. 33). Proponents of occupational licensing have long argued that this form of regulation serves society for any one, or for all, of the following three reasons:

1. The prohibitive cost of information makes it impossible for consumers to distinguish competent from incompetent sellers of certain professional services.

2. Regulation that establishes minimal professional standards of service is said to preclude third party effects.

3. Voluntary individual consumption choices of quality levels of professional service that are lower than some socially determined standard may generate risk to the individual consumer that fellow voters believe he or she should not take, because that harm will affect their sense of well being. (Martin, 1980, p. 143)

An occupational licensing system, under which only licensed providers are legally permitted to offer services to consumers, delivers several advantages over other forms of regulation including certification:

1. Licensure is anticipatory. That is, it attempts to exclude all incompetent practitioners from the market and thus keep the costs of incompetence from materializing.

2. Licensure, by setting standards for providers rather than for transactions, economizes on enforcement costs.

3. A licensing system may, in theory, substantially reduce the information costs faced by consumers by providing a central agency, able to exploit economies of scale, to obtain information about the competence of aspiring practitioners, licensing being based on that central pool of information.

4. A licensing system directly addresses the problem of third party costs and externalities by removing from the provider and client the unfettered right to make any quality choice or assume any risks they please. (Wolfson, et al., 1980, p. 206)

Weaknesses of an occupational licensing system remain potentially serious:

1. Like certification, licensure dubiously assumes a high correlation between required training and desired service outcomes.

2. Licensure introduces the greatest numbers of rigidities and elements of arbitrariness into a market. It acts as though the market were static, isolating and prescribing certain educational and training requirements to be met for a condition for licensure.

3. A licensing regime assumes that either one satisfies the required licensing conditions and provides a corresponding quality of service or one does not meet the standards and is not permitted to provide any lesser quality of service on any terms.

4. Licensure in one market may introduce imperfections in related markets.

5. The public interest defenses for occupational licensing are of questionable merit.

6. Whether licensing of occupations results in improvement in the quality of service offered is debatable. It is not certain that quality of service is improved if a license is required for the performance of an occupation. Licensing is only a crude quality signal.

7. Examining boards are able to control the rate of entry into a licensed occupation by manipulating the pass rate of those taking the license examination. The manipulation of the pass rate is evidence that examining boards administer licensing legislation primarily to protect incumbent licensed practitioners in the licensed occupations.

8. The licensing of an occupation reduces the number who practice that occupation. Those who are excluded make their way into other occupations; they are less productive in those second-best occupations than they would be in the licensed occupation from which they are excluded.

9. The licensed professions pursue stability, and stability, while related to competitive conditions within an industry and therefore to income, is not solely an income related objective. It is also a way of assuring licensed practitioners of the quiet life that monopolists are said to prefer, the quiet life that most of us in fact prefer. (Shimberg, et al., 1973, p. 99; Schuck, 1979, p. 40; Rottenberg, 1980, p. 9; Wolfson, et al., 1980, pp. 207-210)

Weaknesses of an occupational licensing system are staggering and suggest that licensure should be reserved for professional markets characterized by very high costs of provider error, high consumer information costs, or substantial and widespread negative third party effects not fully compensable. Recently, over half the state legislatures have passed laws requiring termination of large numbers of government programs, agencies, and laws by specific dates (Martin, 1980). The construction industry is one which has been least affected by these sunset laws because of its varient market environment, numerous externalities, and other characteristics previously noted. Still, there is no way of avoiding access-quality trade-offs; likewise, there is no policy fully capable of making all those affected better off.

Of the four options discussed for regulating professional practice, standard setting and occupational licensing must coexist to overcome quality problems within the construction market. Mandating continuing education is presently the only accepted method of controlling post-entry conduct in any regulatory strategy.

Implementing a competence-based educational program should overcome many of the weaknesses discussed under both standard setting and occupational licensing strategies.

Continuing Professional Education

Until recently, professionals faced the task of absorbing an essentially stable body of knowledge. During each person's lifetime, little was added to continue learning beyond that required to enter one's field. Nowadays, there can be no such thing as completing one's education, even if one proceeds to the most advanced degree. As once believed, education is no longer a stage in human development. Most professionals have long been involved in continuing education as a means to disseminate the latest research and new approaches to effective practice. Professionals who participate in these activities understand the benefits of continuing education. Five to ten years after entry into a field, 50 percent or more of what one has learned will likely be obsolete (Gross, 1982). Obsolescence is a term that has only recently entered the educational literature. "It is frequently used in discussions of the impact of the informational explosion and very often refers specifically to the rapidly growing need for professional continuing education (PCE)" (Bleuer, 1986, p. 1).

Of the available definitions of continuing education, Rizzuto (1982, p. 38), best explains it as "Formalized learning experiences or sequences designed to enlarge the knowledge or skills of practitioners. As distinct from formal college education, continuing education courses tend to be more specific, of generally shorter duration, and may result in certificates of completion or specialization, but not in formal degree." Continuing education is intended to overcome the potential obsolescence in professional practice. Some of the significant factors forming the background of continuing education's development include

1. Modern technology, which has produced the demand for experts, also destroys experts.
2. The information explosion.
3. The changing nature of knowledge.
4. Increasing organizational complexity.
5. The drive to maintain excellence and to remain competitive.
6. The public's demand for professional accountability.

7. Compulsory relicensure.

8. The threat of malpractice litigation.

9. Conduct of practitioners after entry.

10. Shifts in governmental regulatory patterns. (Harrington, 1977, p. 84; Wolfson, et al., 1980, p. 213; Nowlen, 1988, p. 3)

Researchers are still experimenting with how and where continuing education made the greatest difference to professionals' practice. If the aim was to sustain or improve competence and performance, neither associations, nor universities, nor employers could claim distinctive success. (Nowlen, 1988) Curiously, this can be attributed to agreement among many instructors of entrepreneurial studies that their courses are designed to develop qualities that may be innate. "You can't teach someone to be an entrepreneur, but you can help him or her formulate a very aggressive strategy for success," insists Professor Ian MacMillan of Columbia University. Robert Coffey (1975), of the University of Southern California adds that we can't give students the personal qualities to make things happen, yet we can provide them with the technical knowledge. Mayhew and Ford believes still another problem exists among educational providers:

> Professional service implies service of a special order requiring competence that has been rigorously tested before the professional is admitted to practice. But this raises the question: What connection actually exists between educational standards and professional performance standards? There is increasing evidence of a wide gulf between academic standards maintained by the professional schools and the actual standards of performance in successful practice. (1974, p.5)

The needs of practicing professionals were viewed by Carol Schneider in the *American Journal of Education* as

> ... so disparate and so linked to particular organizational contexts that only observers close to the actual work can hope readily to identify genuinely helpful directions for individual professional development. (1984, p. 536)

There is no lack of research on adult participation in learning activities. The problem comes not in finding and reporting data but in synthesizing across studies to present a meaningful picture. A second limitation of available literature is that many surveys regarding adult education participation patterns (e.g., Johnstone and Rivera, 1965; Carp, Peterson and Roelfs, 1974; and Penland, 1977) were conducted at least ten years ago and

may not accurately reflect 1980s participation patterns. Careful attention must therefore be paid to the use of prior research as it pertains to this present study and future research.

One of the most common ways of dispensing responsibility is by lengthening training programs. From the public's view, this method has the advantage that it can be rationalized on grounds of raising quality. "The longer and more specialized training in turn increases the professional character of graduates, who then better understand and can better articulate the public benefits provided and who also are more aware of the close relationship between their own fortunes and those of the firm" (Rottenberg, 1980, p.21). However, there is abundant evidence that practitioners differ widely in their learning abilities. One person may derive all the benefit that is to be gained after one or two years of formal training, while another may never gain as much after five years. Licensing boards should acknowledge this fact and allow the rapid learner to take a licensing examination whenever he feels adequately prepared. "The amount of time spent in a school or in a apprenticeship may bear little or no relationship to the development of competency" (Shimberg, et al.). To neglect the impact of licensing over the length of training requirements can lead to serious errors in assessing the overall impact of licensure on quality.

At a time when colleges and universities have seen a decline in traditional students, continuing education has been experiencing a dramatic increase in its mission (Millner, 1986). Philip Nowlen, in speaking for the American Council on Education, cites the following two reasons for this increase:

1. Professional life involves continuous reflective practice. Within this general learning environment, continuing education has its episodic uses. Its value is heightened when it is integrated with the larger realm of self-directed learning activities.

2. The one unchanging feature of the professional is unceasing movement toward new levels of performance. In the achievement of these new levels, inadequacies of performance become clear and better levels of performance possible. (1988, pp. 10-11)

Conter and Schneiderman (1982) were able to report that between 17 and 23 million adults were engaged in some form of group or organized educational activity, a head count two or three times as great as the total number of undergraduates enrolled for degree credits. Up to one-half of the practicing professionals in the United States have attended one or more formal continuing education activities (Nowlen, 1988).

Solomon Arbeiter (1976) indicated that the vast majority of continuing education participants were enrolling for job improvement or advancement. Also noted is that the more formal education individuals have, the more likely that they will participate in learning experiences of all kinds throughout their lives (Arbeiter, 1976; Keane, 1985). The U.S. Department of Education in a 1984 survey investigated reasons for participation in adult education and selected results are listed in Table 6 below.

Table 6.

Courses Taken by Participants in Adult Education

reason	total (1000) male	total (1000) female	percent distribution male	percent distribution female
Total courses[1]	17,770	22,981	100.0	100.0
Job-related reasons	12,607	13,552	70.9	59.0
To get new job	1,824	2,979	10.3	13.0
In current occupation	395	588	2.2	2.6
In new occupation	1,428	2,389	8.0	10.4
To advance in job	10,004	9,696	56.3	42.2
Other job-related reasons	780	876	4.4	3.8
Non-job related reasons	5,116	9,330	28.8	40.6
General education	1,448	1,910	8.1	8.3
Personal or social	3,299	6,932	18.6	30.2

1. Includes courses or reasons not shown separately

Source: U. S. Department of Education, (1984)

Minnock further defines the motives of professionals for participation distinguishing between mandated and voluntary education programs in Table 7.

The continuing education unit (CEU) was devised in support of quantifying and tracking continuing education experiences. "The CEU is defined as 10 contact hours of participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instruction" (Nowlen,

Table 7.
Mean Scores for
Very Important Reasons for Participation

reason	mandated N:68	non-mandated N:66
Increase proficiency	6.72	7.82
Satisfy an inquiring mind	6.48	5.80
Gain knowledge for own sake	6.40	6.52
Immed. practical benefit	6.35	6.82
Professional advancement	6.30	5.80

Scale

Not Important		Somewhat Important		Moderately Important		Very Important		
1	*	3	*	5	*	7	*	9

Source: Minnock, 1986, p. 59

1988, p.7). Workshops and other short courses are preferred over formal course work because the granting of CEU credit is usually based solely on evidence of attendance and participation, whereas formal course work typically carries with it the threat of assessment of performance either through examinations or course projects.

The key concept that provides the basis for the design of most adult learning activities is that of andragogy. Knowles (1968) introduced the term to American literature to identify the body of principles that was emerging in regard to the teaching of adults and to distinguish these principles from pedagogy, the teaching of youth. "Since its introduction in 1968, the concept of andragogy has stimulated numerous research studies on the differences between andragogy and pedagogy in terms of learning climate, responsibility for planning, identification of needs, formulation of objectives, curriculum design, learning activities, and evaluation strategies" (Bleuer, 1986, p. 42). According to Knowles, the differences in the assumptions between pedagogy and androgogy are centered primarily in five areas: self-concept, experience, readiness, time perspective, and orientation to learning. Regarding self-concept, pedagogy assumes dependency of the learner, while andragogy assumes increasing self-directiveness. Pedagogy considers the learner's experience of little worth, while

andragogy views learners as rich resources for learning. In pedagogy, readiness is determined by biological development and social pressure; in andragogy, developmental tasks of social roles determine readiness. In pedagogy, application of learning is postponed; in andragogy, application is immediate. Finally, pedagogy is subject centered, while andragogy is problem centered.

There have been numerous studies based on the concept of andragogy to produce a comprehensive set of adult learning principles. Probably the most concise set is that of Knowles' "conditions of learning." The conditions which he advocates are

1. The learners feel the need to learn.
2. The learning environment is characterized by physical comfort, mutual trust and respect, mutual helpfulness, freedom of expression, and acceptance of differences.
3. The learners perceive the goals of a learning experience to be their goals.
4. The learners accept a share of the responsibility for planning and operating a learning experience, and therefore have a feeling of commitment toward it.
5. The learners participate actively in the learning process.
6. The learning process is related to and makes use of the experience of the learners.
7. The learners have a sense of progress toward their goals. (1980, pp. 57-58)

Andragogy addresses the issue of identification of the professional continuing education needs from both the perspective of the profession and from the perspective of the professional, i.e., one's life and career development needs. The life stage or phase theorists (e.g., Erikson, 1959; Neugarten, 1968; Havighurst, 1970; Sheehy, 1976; and Levinson, 1978) have produced an abundance of literature that attempts to correlate individuals' developmental needs with various predictable stages or phases of life. Aslanian and Brickell (1980) focused on the transitions between stages rather than the stages themselves, and, more specifically, on trigger events that occur in conjunction with transitions and cause adults to undertake a learning task at a particular time. Examples of trigger events include getting a promotion, having a baby, getting fired, getting divorced, etc. The director of the Massachusetts Institute of Technology's Program on Corporate Change and Job Creation, David Birch, comments on his own experience recognizing andragogical effects upon organizational performance:

> The one thing I hadn't banked on at all is the extent to which a company becomes a community. I thought people would come to work, do their jobs, and go home. I didn't think they'd have babies and get married and get all wrapped up in each other's lives the way they have. I spend a significant amount of my time trying to make the members of the community cooperate with each other. It can be a positive force because it brings a cohesiveness to the firm. But I hadn't thought about how much time I'd have to spend adjudicating the frictions in that system so it remains a positive force — balancing all the interests. . . . One way or another, I spend probably a quarter of my time on this. I hadn't planned on spending one percent. (1989, p. 39)

Andragogical issues raised by Birch's experience could be managed by addressing the transitions in, or stages of, the practitioner's life in which either involves the context of Knowles' cited learning conditions.

Separate from conflicting theoretical approaches, recertification and continuing education are not enthusiastically embraced by professional associations (Gilley, 1985). Yet, if mandated, professional groups which oppose other methods of recertification believe that it should be sufficient for licensed practitioners to present evidence of continuing education for recertification. This approach would work only if the nature of the continuing education activity was carefully defined and if some mechanism were available to ascertain whether the practitioner had, in fact, satisfied the instructional objectives of the program. Craig (1984) stated that the lack of quality control in continuing education is due to the fact that the "CEU concept is antithetical to much of the advanced thinking in the training and development field because it measures 'chair time only' and is not achievement or competency based" (p. 44). "Mere attendance at professional meetings would not seem to constitute acceptable evidence that a practitioner has maintained his skills and kept up with important developments in his field" (Shimberg, et al., 1973, p. 225).

In seeking to improve licensing of various skilled occupations, a necessary first step would be the determination of reasonable standards of performance. Continuing education for professionals is both a disorderly buyer and seller marketplace. Practitioners' selection of learning experiences is faddish and frequently haphazard; some faculty members have been seduced from institutional loyalty by entrepreneurship; and when professional associations double as continuing education providers and accreditors, there is at least the appearance of impropriety. Standards are therefore a prerequisite for any sound training program and are equally indispensable to the assessment of competence. "Systematic studies are needed to establish what knowledge levels and levels of skill are required in order to insure minimally safe performance on the part of craftsmen" (Shimberg, et al., 1973, p. 123).

Mandatory Continuing Professional Education

Only recently have many professionals become subjected to mandatory continuing education. Continuing education requirements for professionals come in many forms and from many sources. "The philosophy that a professional licensed or certified in a given field possessed lifelong competence in that area was once unquestioned" (Moser, 1986, p. 15). Most professions consider this philosophy quite impractical today where the knowledge in any given field is no longer small and slow-growing. One-shot certification and licensure have been recognized as contributing to professional incompetence, and thus have been a significant factor in the growth of recertification and relicensure (Long and Boshier, 1976). After all, the profession is not like a country club where membership is a matter of form rather than competence. Concerns raised about the continuing competence of professionals by consumer groups, governmental agencies, state legislators, and the professions themselves, has resulted in the growth of the mandatory continuing education movement to satisfy growing requirements for recertification and relicensure. In Table 8, Phillips (1986) summarizes the present status of states' mandating continuing education for selected professions.

The Secretary of the Department of Health, Education and Welfare submitted to Congress in 1971 a report stating: "The professional organizations and states are urged to incorporate a specific requirement for the assurance of a continued level of practitioners' competence as one condition in the recredentialing process" (Edwards and Green, 1983, p. 45). It was recognized that merely making continuing education opportunities available would not assure their utilization. A 1967 report from the National Advisory Commission on Health Manpower encouraged individual states to develop additional standards for higher quality controls within their jurisdictions by stating "relicensure should be granted either upon certification of acceptable performance in continuing education programs or upon the basis of challenging examinations in the practitioner's specialty" (Grussing, 1969, p. 224). Twelve years later, Grogan reported that although some states have embraced the concept of mandatory continuing professional education more than others, no specific geographical pattern was apparent. This disparity exists because individual states generally license professionals, and mandating continuing education is likewise a state decision.

Attitudes and trends which have their basis in national concepts can often transcend state borders (Queeney, 1981). As a result, there seems to be a relationship between mandatory continuing education and

Table 8.
Status of Mandatory Coutinuing Education for
Selected Professions

	number of states[1]		
	required by statute or regulation	enabling legislation passed	required under certain circumstances
Architects	1	6	
Certified Public Accountants	47		
Dentists	13		
Engineers (Professional)	2	2	
Lawyers	20	4	
Nurses	11	2	7
Nursing Home Administrators	43		
Optometrists	46	8	
Psychologists	13	8	
Pharmacists	36	3	
Physical Therapists	4	2	1
Physicians	21	3	2
Real Estate Salesmen and/or Brokers	29		3
Social Workers	20	2	1
Licensed Practical/ Vocational Nurses	10	1	7
Veterinarians	26	1	

1. Includes District of Columbia
Source: Information obtained from national professional associations. Phillips, 1986, non-published

factors characterizing a profession. For example, it appears that continuing education is more likely to be mandated in: (1)older professions; (2) professions that have legal interests or that are directly health-related; (3) professions where private practice is the dominant mode; and, (4) professions that have the strongest professional associations (Long and Boshier, 1976; Houle, 1980). Moser (1986) attempted to investigate characteristics within continuing professional education which consistently linked varied occupations to national concepts. He summarizes his findings citing the following trends:

Table 9.
Analysis of Attitudes Toward Mandatory Continuing Education and Age[1]

age	favoring N	%	opposed N	%	neutral N	%	total N	%
20-39	97	46.6%	98	47.1%	13	6.3%	208	100%
40-49	66	38.6%	95	55.6%	10	5.8%	171	100%
50-59	10	15.9%	50	79.4%	3	4.8%	63	100%
60 plus	1	3.4%	28	96.6%	0	0.0%	29	100%
total	174		271		26		471	

1. Percentages are in relationship to the number of respondents in each age category
Source: Moser, 1986, p. 73

> Personal and professional characteristics producing statistically significant differences in attitudes toward mandatory continuing education included factors of: occupation, health vs. non-health occupations, age, and level of educational attainment. Characteristics of employment status, gender, marital status and the number of hours required each year for relicensure did not produce significant differences in attitudes among professionals. (abstract)

Tables 9, 10, and 11 outline in detail the conclusions of Moser's 1986 investigation.

The most hotly debated issue in professional continuing education literature is that of voluntary vs. mandatory continuing education (MCE). The debate over MCE stems not over the need for professionals to continue their education, but rather over how best to assure that all professionals will continue to learn so that they will become, or continue to be, competent practitioners. "Mandatory continuing professional education evolved during the 1970s and required professionals to show evidence of participation in continuing education activities and programs as a prerequisite for state relicensure" (Moser, 1986, p. 1). Many studies have shown MCE to be the most acceptable means of monitoring professional competence (e.g., Cooper, 1980; Smith, 1981; Moser, 1986) because considerable support exists among practicing professionals for mandatory continuing

Table 10.
Analysis of Attitudes Toward Mandatory
Continuing Education and Profession

profession	attitudes toward mandatory continuing education[1] favoring N	%	opposed N	%	neutral N	%	total N	%
Pharmacists	480	80.9%	113	19.1%	0	0.0%	593	100%
Dentists	1,406	65.5%	740	34.5%	0	0.0%	2,146	100%
Nurses	2,199	61.7%	704	19.8%	660	18.5%	3,563	100%
Phys. Ther.	846	58.0%	609	41.7%	4	.3%	1,459	100%
Psychologists	74	56.5%	57	43.5%	0	0.0%	131	100%
C.P.A.'s	252	48.6%	204	39.3%	63	12.1%	519	100%
Physicians	428	45.0%	524	55.0%	0	0.0%	952	100%
Lawyers	92	44.0%	117	56.0%	0	0.0%	209	100%
total	5,777		3,086		727		9,572	

1. Percentages are in relationship to the number of individuals in each profession
Source: Moser, 1986, p. 67

Table 11.
Analysis of Attitudes Toward Mandating
Continuing Professional Education and General Characteristics
N:137

characteristics	mandated		non-mandated	
Gender: Female	43	63.2%	54	78.8%
Male	25	36.8%	15	21.2%
College Graduates	43	63.5%	25	36.5%
Non-College Grads.	25	36.5%	43	63.5%

Source: Minnock, 1986, p. 52

Table 12.
Attitudes of Professionals (total) Toward
Mandatory Continuing Education

attitude toward MCE	absolute frequency	relative frequency
Favoring MCE	5,777	60.3%
Opposed to MCE	3,071	32.1%
No Opinion	727	7.6%
total	9,575	100.0%

Source: Moser, 1986, p. 66

education in spite of increasing recognition of its limitations. Table 12 illustrates a summary of sixteen different regulated occupations' acceptance of mandatory continuing education. Whether this represents an acceptance of professional responsibility for continual learning or the inevitability of changes in the relicensure process, after years of debate, professionals appear to be accepting such mandates more readily. Legislation mandating continuing education for professions is based on a variety of assumptions from which four fundamental assumptions include

1. Every profession has lazy or uncaring persons who are unwilling to keep up in their field.
2. Professionals will be more competent and caring with increased knowledge.
3. Someone other than the professional knows better in regard to what that person should learn and how it should be learned.
4. Exposure to meetings, courses, readings, and other educational activities, will reinforce new and existing knowledge and skills, along with acquiring new knowledge and skills. (Apps, 1980; Smith, 1981)

Current literature yields more discussion focusing on arguments opposed to mandatory continuing professional education rather than arguments favoring the concept of mandatory continuing education. A discussion of opposing and supporting arguments follows.

Arguments Against Mandatory Continuing Professional Education

One of the strongest arguments against mandatory continuing professional education is that a relationship between participation in continuing education and increased knowledge, to say nothing of competence, is extremely difficult to establish. No such evidence exists that attendance in continuing education activites results in improved practice or greater competence (e.g., Golden, 1978; Liseman, 1980; Guenlette, 1981; Quatrano and Conant, 1981; Queeney, 1981; O'Reilly, Tifft & DeLena, 1982). Consumers are demanding competent practice, not mandatory continuing education. MCE for professionals may mislead the general public into thinking that continuing education produces a qualified professional. Knowledge can be viewed as a question of currency, where competency is a question of ability and motivation. The professional's application of knowledge, not their lack of knowledge appears to be the major problem. (Grogan, 1979; Cooper, 1980; Howles, 1980).

The learning needs and competence criteria among individuals are likely to vary tremendously even among those individuals belonging to the same profession. Mandatory continuing education presently fails to take into account the specific learning needs of individuals in the same profession. Learning needs of any individual change as that person moves to a different position, as responsibilities are increased, and as new techniques are developed (Baskett and Taylor, 1980; Cooper, 1981; Rockhill, 1983).

There is fear that making a profit may become a priority for educators. Continuing education offerings may exploit genuinely well-motivated enrollees who pay a fee which has no relationship to either the content or the length of the course (Cooper, 1981). Legislative mandates on continuing education have created yet another economic enterprise for providers who seek to supply a commodity, as programs usually generate surplus funds (Long and Boshier, 1976; Phillips, 1978). There is not only the direct cost of the activity, but indirect costs such as loss of time from a professional's practice, the cost of food, transportation, and lodging. The cost of professional service is certain to increase by mandating continuing education, and this cost will likely be passed on to the consumer. (Baskett and Taylor, 1980). The public will absorb the costs of continuing education when, in fact, its potential value in assuring the public's welfare and safety has not yet been proven (Moore, 1976).

There are a number of factors that influence the selection of a particular continuing education activity by a professional. Professionals take courses that are the easiest and most convenient (Lowenthal, 1981). "The cost, time, location, amount of credit being offered, and interest in the subject matter influence individuals in their selection of continuing education activities" (Moser, 1986, p. 27). A direct relationship is evident between the closeness of the due date for completing the mandatory continuing education requirements and the lack of relevance to job requirements or deficiencies (Sullivan, 1975).

"Nothing in the system requires licensees to identify their weakness, nor are they required to take courses, or pursue other types of learning experiences that will help overcome these competency deficiencies" (Edwards and Green, 1983, p. 44). Because professionals are generally unaware of their weak areas, they will tend to participate in continuing education courses which are personally interesting rather than classes that are needed to improve deficiencies in knowledge or skills (Golden, 1978; Sullivan, 1975). This result may lead to professionals enrolling in courses "which are either duplicative of competencies already possessed or irrelevant to their needs" (Moore, 1976, p. 100). Motivational reasons which have shown to be significantly different for participation in voluntary versus mandatory continuing education were investigated by Minnock (1986) and are presented in Table 13.

There have been few attempts to ascertain what participants learned in a continuing education activity, or how much they knew prior to an activity. Efforts to determine how, or if, they applied what they learned to their practice are also quite uncommon. The only criterion for quality control is the amount of chair-time put in. No assumption is made as to the mastery of content or how successful the person was in completing the course (e.g., Long and Boshier, 1976; Cooper, 1981; Rockhill, 1983; Tucker and Huerta, 1984).

Moore (1976) noted that the value of mandatory continuing education is dependent upon the attitude of the individual professional. Not only is mandatory continuing education for professionals in direct conflict with the classical concept of professionalism, but it also violates the basic tenets of the field of adult education. Such tenets include voluntarism, open access, learner involvement, multiple means, and meeting the needs of multiple publics. Many studies support this concept by showing that most professionals routinely participate in continuing education well above the requirements set by regulating bodies. Professionals are generally self-directed and do not want to be told how to function by government agencies. A motivated professional will learn

Table 13.
Significantly Different Mean Scores for
Mandated Respondents vs. Non-mandated Responses

status	mandated N:68	non-mandated N:66
Professional Advancement	6.30	7.28
Higher status	3.26	5.52
Keep up with competition	3.37	5.03
Increase proficiency	6.72	7.82
Self reflection	3.87	2.43
Serve mankind	5.72	3.75
Keep pace with others	2.93	4.33
Mandate of profession	5.26	2.94

Scale

Not Important		Somewhat Important		Moderately Important		Very Important		
1	*	3	*	5	*	7	*	9

Source: Minnock, 1986, p. 60

without mandating continuing education. Likewise, a professional who is not motivated will not learn despite being forced to participate in educational activities. Not only is there no evidence that mandating continuing education for professionals guarantees learning, but also there is growing awareness that it undermines it. (e.g., Baskett and Taylor, 1980; Lowenthal, 1981; Ohliger, 1981). "The impossibility of any single person ever being fully up-to-date has caused some to make more discriminating continuing education choices and others to question whether being up to date has value in and of itself" (Nowlen, 1988, p. 28). Forcing all professionals to continue their education in order to minimize substandard performance by a few professionals will only create negative effects.

Arguments Favoring Mandatory Continuing Professional Education

Proponents of mandatory continuing education have cited many reasons why it is necessary to force professionals to continue their education. Sasmor (1979) estimated that 75 percent of the professional knowledge gained during a practice career is gained from continuing education. The pervasive scientific and technological developments within our society have created a knowledge explosion, and professionals should keep abreast of new developments. Better informed professionals and increased awareness of new developments will be the result of mandatory continuing professional education (Liseman, 1980; Lowenthal, 1981).

The failure of the voluntary approach to learning by professionals has, in part, contributed to the movement toward mandatory continuing education. Many practitioners, once licensed, do not remain voluntarily compliant with their occupations as well as they should. Those who do not keep abreast of new developments embarrass the field and do harm to the professional image as well as to clients and third parties. Mandating continuing education must be the inimitable response, since it is evident that voluntary continuing education has been unsuccessful due to abysmal participation; nor, do many professional associations stimulate or require their members to continue their education despite the existing hype raised by the professional associations. Many practitioners do not even belong to occupational associations (Loveland, 1979; Tucker and Huerta, 1984; Gilley, 1985).

Not only is requiring a professional to continue to learn intended to protect the public, but it also counteracts negative public opinion by improving the confidence the public has in a professional. Mandatory continuing education is an effective mechanism for a profession to prove to its consumers its commitment to improve the quality of its services (Mote, 1976; Lowenthal, 1981; Tucker and Huerta, 1984).

A professional's core of knowledge may also shrink with time because of one's physical or geographical isolation from their peers or the mainstream of their practice (Baskett and Taylor, 1980). Mandatory continuing professional education forces communication and collegiality as it allows for informal interchange among professionals. Professionals are finding the interaction with colleagues and faculty in sharing and discussing common concerns an added benefit of participating in educational programs. Many participants indicate they learn just as much or more outside of a program in social functions.

"New Professionals also prefer continuing education for relicensure because self-selection of learning activities are based on personal interests and needs as permitted" (Moser, 1986, p. 37). Often, their acceptance of mandatory continuing education has been done to forestall laws requiring periodic examination for relicensure or recertification or requiring peer reviews, which are deemed to be more threatening to the professional as evidenced in Table 14. Many report (e.g., Grogan, 1979; Richards and Cohen, 1980; Lowenthal, 1981; Edwards and Green, 1983) mandatory continuing education is flexible in terms of time, location, format, delivery and price, thus making it the most convenient method at present in regard to availability and accessibility where the requirements are general enough not to become a burden.

Licensure, certification, and continuing education have become mandatory in many occupational fields because state legislatures recognize that the initial entrance requirements to an occupation do not guarantee continued competence. Mandatory continuing education has also been identified as an effective method for removing professionals who are no longer competent in their field of practice. Professionals may become unfit to practice due to clinging to outdated methods of practice, aging or other physical or mental incapacities. Requiring continuing education can also remove the practice privileges of those professionals who have become disinterested or are no longer working in their initial field of licensure (Moore, 1976; Grussing, 1979; Lowenthal, 1981).

Table 14.
Attitudes of Professionals Toward
Periodic Reexamination

response	absolute frequency	relative frequency
Favoring	337	17.9%
Opposed	1,409	74.9%
Neutral	134	7.1%
total	1,880	99.9%

Source: Moser, 1986, p. 75

Future Trends of Mandatory Continuing Professional Education

Although the movement for mandatory continuing education has grown substantially in response to the public demand for competent professionals, recently some relicensure laws have been rescinded as the concept of mandatory continuing professional education is being reexamined. Ohliger (1981) stated that the tide may be turning for professionals in some states because mandatory continuing education has not turned out to be the panacea some thought it might be. "Only some choose to take courses; others find organized instruction inefficient or inappropriate to their ends" (Rockhill, 1983, p. 115). Therefore, they need to find an avenue for expressing their ambitions along other lines. "Opposition to mandatory continuing education has been growing among adult educators and others for several years" (Moser, 1986, p. 43). The cost of establishing and maintaining mandatory continuing education in some states, as well as evidence of a backlash against over-regulation makes it seem likely that states will move more slowly in passing enabling legislation in the future (Cooper, 1980). Professional organizations, unhappy with legislative control, have suggested that their professional association mandate alternatives to continuing education for relicensure or recertification (Apps, 1980). Mandatory continuing professional education may well be on its way out.

In addressing the complexity of the MCE issue, Cross (1982, p. 42) suggests that questions center around the following three issues:

1. To what extent should free American citizens be coerced into education?
2. Is compulsory education effective; that is, do people who are required to attend continuing education classes necessarily become more competent?
3. Who should be charged with developing and enforcing standards for professional accountability?

After investigating both sides of these issues, she concludes that they are unlikely to be resolved to everyone's satisfaction within the next decade. "Until substantial work is done to develop instrumentalities for understanding and assessing professional performance, the practice of mandating continuing education as an assurance of desirable levels of performance should be deferred" (Nowlen, 1988, p. 10).

Continuing Professional Education Models

In order for any new recruits to a profession to be able to enter professional practice successfully, the content of their basic professional education should equip them to respond to these demands. Attention too often is typically directed towards this basic education with no guidance for responding to new and changing demands. This discussion shall focus on three different approaches to respond to and overcome negative effects associated with changing environments: update, competence, and performance.

The Update Model

The advance of knowledge creates a gap between what practitioners know and do, and what they could know and might do. Informational updates have the unending task of closing such gaps where keeping up is the imperative driving professionals to continue their education (ref., Fig. 4). The information-intensive, short course update is overwhelmingly the characteristic continuing education approach. In what is typically a two or three day course, a single instructor lectures to fairly large numbers of professional practitioners who remain

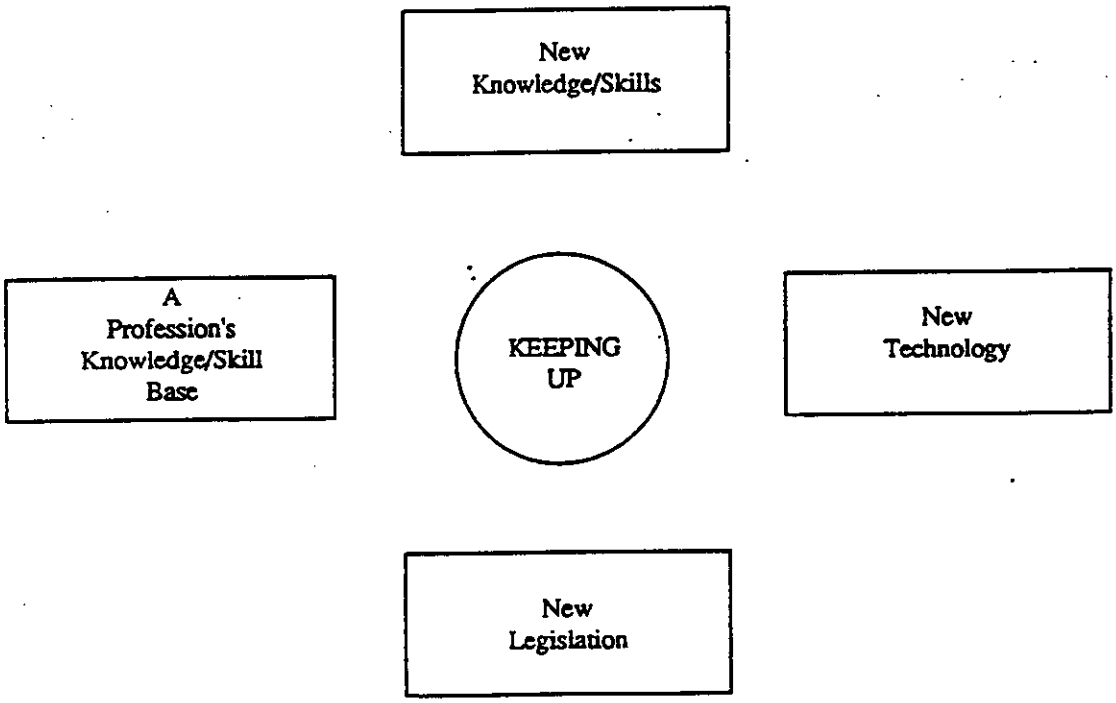

Figure 4. The Update Model

Source: Nowlen, 1988, p. 24

seated for long hours, appointed with fat binders. These heavily didactic short courses pursue the central aim of keeping professionals up-to-date in their practices.

New knowledge is created by scientists, scholars, and innovative practitioners doing basic research. Their interests and opportunities are often influenced by the dynamics of their own profession, yet they are almost never troubled by issues of immediacy of application for the practicing professional. Other minds work to produce decision models that, in turn, may enhance the problem solving proficiencies of practitioners. Professionals often say they feel most professional when they are applying a research-based technique, in that their problem solving is firmly grounded in certainty, stability, and logic (Schon, 1983).

When the educator or association chooses among potential updates to offer, and when the learner selects one update opportunity over another, there are criteria at play that carry each well beyond considerations of simply being up to date. Universities and professional associations are concerned with the relative impact on the professions and their clients of new information, legislation, skills, procedures, and technologies. Professionals are concerned with the relative difference the conference, seminar, or course is likely to make in their practice or organization. The question becomes: what is the intent of being up to date as applied to professional practice? This model does not incorporate necessary linkages to establish competencies, proficiencies, or performers. By avoiding an application-oriented approach, one cannot ensure that clients, consumers, and third-parties are better off.

The Competence Model

Being up-to-date is only one aspect of the relationship of knowledge and skill to competence. Updates rarely address competence-related aptitudes and strengths such as interpersonal skills and motivation, or the events and personal weaknesses that impair competence (ref., Fig. 5). How can the public be assured that all licensed practitioners have maintained their skills over time? Updates maintain or enhance the competence of only some persons, some of the time. Renewal of all licenses should be contingent upon the demonstration of continued competency. A competent practitioner who is confident of his ability should certainly be willing to be assessed periodically to demonstrate that he has kept up with his field. It is the responsibility of a licensing agency to assure itself that all licensees maintain some minimum standard of competency and that they are able to practice effectively in their occupation.

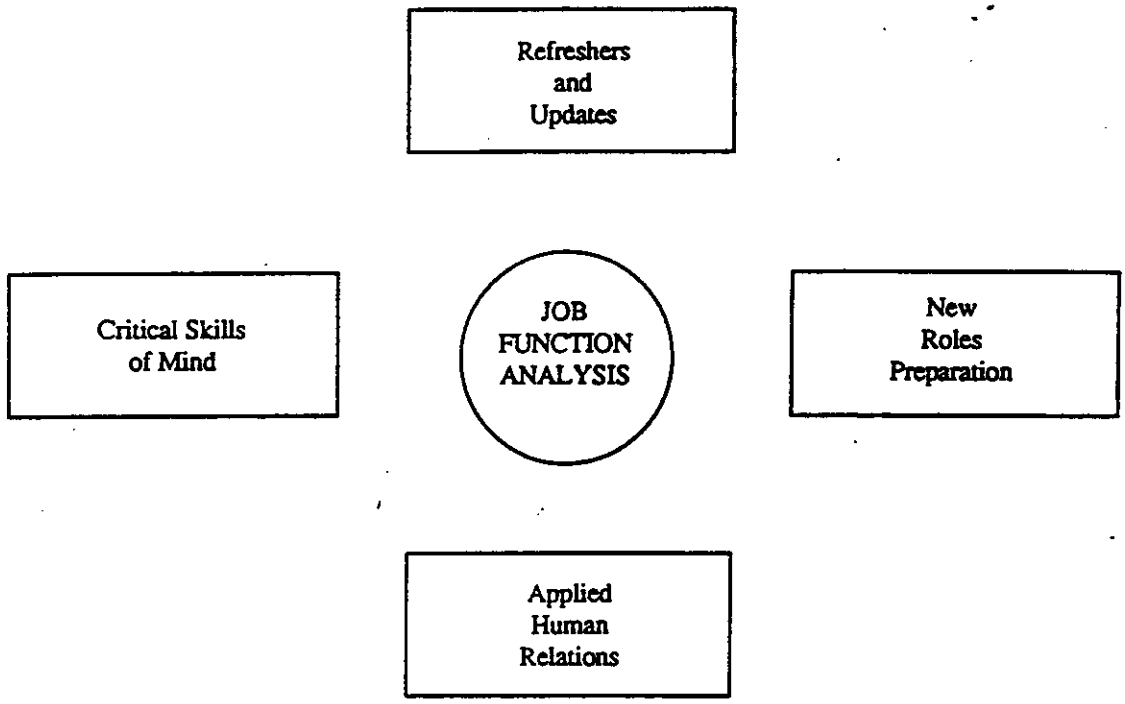

Figure 5. The Competence Model

Source: Nowlen, 1988, p. 32

Competence is most generally defined as marked or sufficient aptitude, skill, strength, judgment, or knowledge without noticeable weakness or demerit (Nowlen, 1988). Definitions refer to both the presence of characteristics or the absence of disabilities that render a person fit, or qualified, to perform a specific task or to assume a defined role. What competencies make the greatest difference in a professional practice, agency, or organization? On what competencies are professionals drawing when they deal successfully with the uncertain, the unique, the unstable? What competencies are actually at work in successful professional performance? How can such competencies be taught? Questions such as these must be addressed.

To bring some order out of this existing chaos, a job analysis program should be undertaken to provide a sound basis for developing educational programs and evaluating the competency of workers upon completion of training. The goal of this analysis is to determine what knowledge and skills are needed to achieve various levels of performance (Shimberg, 1973). Competence, understood as knowledge and skill, is more easily investigated and defined by research. This critical first step would establish what practicing contractors really do for a living. In many cases, state and regional cooperation on competence model research has resulted in

collaborative continuing education programs. Individuals involved in surveys, simulations, and site visits integral to competence model development have increased their own sophistication about professional competence and continuing education as a result (Nowlen, 1988).

The Performance Model

The richer concept of competence has to receive more careful attention if the relationship between competence and performance is to be better understood. The most serious flaw in the competence approach is its implicit assumption that performance is entirely an individual affair that leads the model logically, if erroneously, to an exclusive focus on the individual. There are other influences, however, and they stem from the quality of the relationship individuals have to one another in the organizational setting: the ensemble of peers, subordinates, superiors, and systems. "It is this ensemble that can cripple or enhance individual effectiveness. Performance is as much a function of the ensemble as it is of the individual" (Nowlen, 1988, p.61). The competence model requires serious evolution and reconstructive surgery before a performance-oriented, continuing education model can emerge.

Even as an individual matter, performance is the result of interacting social and personal influences. Continuing education's interaction with personal or organizational performance can be modeled (ref. , Fig. 6). Persons, as well as organizations, engage in guided self-assessment, a kind of performance triage. The focus for the triage brings more than job functions into view. Included are other variables demonstrated to have a strong influence on performance: baseline knowledge and skills; the challenge of new roles; requisite skills in human relations; proficiency in self-managed learning; the fit of individual and organization to one another; skills in coping with life's surprises as well as its anticipatable transitions; and, understanding of the influences of environments and the skills to orchestrate them (Nowlen, 1988).

Practitioners, educators, and legislators should initiate a foundation for learning and development agendas by undergoing competence assessment. Examination of sufficient cases of individual performance by professionals in similar settings will yield useful information about the interaction within performance's double existance. By working back from instances of failed or weak performance, one can identify the oftentimes multiple sources of difficulty. Once the person's or organization's performance profile has been compared with

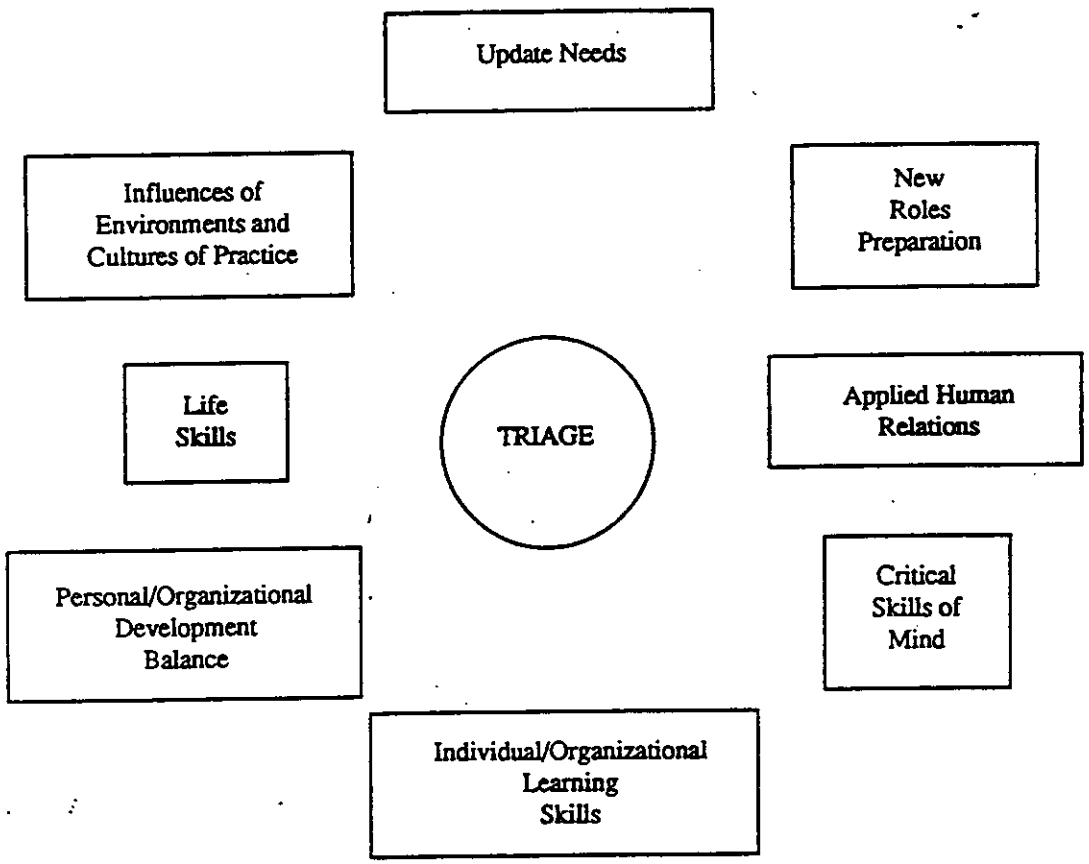

Figure 6. The Performance Model
Source: Nowlen, 1988, p. 87

appropriate profiles of successful performance and key contributing factors have been identified and analyzed, development and learning agendas will begin to emerge (Nowlen, 1988). Continuing education providers must then design responsive learning and development paths accordingly.

To bring performance and continuing education into widespread interaction involves serious research work and design. Presently, this model may be more of an undertaking than the construction profession is willing to accept. Yet, when performance critical learning objectives drive the design and selection of continuing education experiences, the field will have progressed from updates, through the competence model, to a performance-oriented model.

Evaluation of Continuing Professional Education Courses

The ability to use the knowledge taught and learned in professional education is the critical objective of the activity, and thus, the curriculum's evaluation is essential. The most common use of evaluation in formal education is in diagnostic, formative, and summative judgments of learning: assessing students' knowledge and skill before setting learning goals or undertaking learning activities; providing feedback on student progress; and, measuring gains and certifying achievement (Bloom, Hastings, and Madaus, 1971). This approach is deservedly widespread, occupying a place within higher education. Within continuing education, the most employed form of evaluation is the appraisal of teaching – monitoring an activity in progress to assess the extent to which its elements facilitate learning, require modification while still in progress, or must be changed or eliminated before representation. Seldom will continuing education evaluation move beyond questions of teaching and learning to the issue of its impact: Did the learning make the difference it was intended to make? (Knox, 1979) "Almost never does evaluation focus on the quality of the original judgment by which an individual, professional association, or corporation concluded that a particular educational activity or sequence would achieve the goal desired" (Nowlen, 1988, p. 153).

Workshop providers are facing increasing demands for accountability. These demands are being influenced by:

1. Professionals who want assurance that they will acquire knowledge, skills, and resources that they can actually use either in their current jobs or for advancement of their careers.
2. Administrators who want assurance that their use of limited inservice funds to finance staff participation will pay off in improved or enhanced job performance.
3. Professional associations and educational institutions that want assurance that the workshop will reflect positively on their organizations.
4. Accreditation boards want assurance that workshops they endorse meet high standards of professional quality. (Bleuer, 1986, p. 4)

Workshop providers must pay careful attention to these demands and must find ways not only to deliver what is needed, but also to demonstrate that the delivery has been successful. The limited availability of research on and models for the evaluation of workshops has been clearly illustrated by Bleuer (1986) in a search of the ERIC database. Of a total of 175 entries, only seven specifically addressed the evaluation of workshops. Research

concludes that participants are not good predictors of the value of educational experiences, and, hence, create increased difficulty in developing an evaluation strategy (e.g., Wolf, 1979; Quinn, 1981). Without a comprehensive evaluation plan designed specifically for continuing education workshops, it would be very difficult to assess the activity's true impact. As a result, it would be very laborious to adequately respond to either the demand for accountability or the need for information that can be used for program improvement.

"In terms of problems related to the utilization of PCE workshop evaluations, it appears that lack of use of evaluation results is not as much the problem as is misuse of evaluation results" (Bleuer, 1986, p. 52). As Deniston (1980, p. 94) states, "Program evaluation is a process of answering several different questions about programs, and may be done well, yielding accurate answers, or poorly, yielding inaccurate answers. But be done, it will. And the results will be utilized. If inaccurate, poorer decisions about future programs will be made." To develop an evaluation plan that will adequately address both the demands for accountability and the needs for information for program improvement, there must be a theoretical model of how workshops are intended to function which address:

1. What knowledge, skill, or attitude state participants are in when they enter the workshop.
2. What changes in these states are expected as the participants progress through the workshop.
3. How the workshop program is expected to facilitate these changes.
4. What final outcome states are expected for the participants.
5. How participants are expected to apply these outcomes in their own settings. (Bleuer, 1986, p. 9)

The literature review found that most workshop evaluations consist of one or two-page feedback form prepared and administered by the workshop sponsors or presenters. This questionnaire solicits opinions about an educational program's worth and is frequently administered at the conclusion of a program. Determining meaning from these questionnaires is a hazardous process because they can have a powerful effect on the future of a continuing education program. Even though questions may ask participants to rate the usefulness or effectiveness of specific program components, the object of the assessment is still the program rather than the intended outcome. Thus, the intended outcome must be inferred; i.e., if they liked it, found it useful, or thought

it was effective, they must have learned something. Or worse, the better they liked it, the more they learned and the more likely they will apply what they learned (Bleuer, 1986). At the core of the evaluative process is the faith that persons will perform competently when their knowledge and skills are up-to-date. When such high-inference measurement tools are utilized in education decision making, serious misinterpretations can and will occur.

When significant differences in individual participants' needs, resources, and expectations exist, the workshop can appear to be highly effective for some, moderately so for others, or totally ineffective. In some situations, this means that the workshop should be modified to better meet the needs of the participants; but, in other situations, it means that the workshop should remain the same, and more attention should be paid to the types of participants who are recruited or accepted (Bleuer, 1986). Attempts to accurately interpret variant results have raised a number of questions:

1. How can the same program component receive such diverse ratings?
2. If the diversity is not in the program components but in the participants' themselves, what specific characteristics (needs, images, expectations, etc.) account for this diversity?
3. Do participants with certain types of images and expectations consistently respond better to one type of workshop component than to another?
4. How can these linkages be documented? (Bleuer, 1986, p. 14)

Cervero and Rottet (1984) suggest that research be redirected from determining effectiveness to analyzing effectiveness. In response to the many contradictory conclusions regarding whether or not PCE results in improved performance (e.g., Lloyd and Abrahamson, 1979), Cervero and Rottet suggest, "A more useful research approach would focus on understanding why some programs are more effective than others in improving the performance of professionals" (p. 136). Specifically, they ask: "Under what conditions?"; "For which types of individuals?"; and, "Which program characteristics?" Cervero and Rottet's study also calls attention to the fine line between research and evaluation. The similarities and differences between research and evaluation have been described by several writers (e.g., Guba, 1969; Stake, 1969; Worthen and Sanders, 1973). Two of the most common distinctions are: (1) that evaluations investigate what happens, while research investigates why it happens, and (2) evaluation results are specific to a designated setting, while research results

are generalizable to other settings. However, as Cronbach (1980, p.7) states, "An evaluation of a particular project has its greatest implications for projects that will be put in place in the future." It then becomes apparent that evaluations are beginning to serve research functions, thus increasing the need for and importance of a framework for organizing the efforts that pertain to the study of continuing education programs.

Evaluation in the Update Model

Many continuing education providers and consumers believe that the fully up-to-date professional is a person who functions effectively. It is rare for these activities to be preceded by a continuing educator's assessment of learner knowledge and skills because it is assumed that the decision to participate flows from learner self-assessment. The need for external validation may be continuing education's way of acknowledging the impossibility of assessing the impact of its updates upon individual and organizational performance (Nowlen, 1988).

Some improvements in the use of evaluation within the update model can be achieved with modest effort and expense. The same concluding questionnaire could be mailed to program participants several months later. Marked differences between the profiles of participant opinions will invite selected follow-up. Six months following the program, those persons who participated in the designated focus group can be questioned about the extent to which they believe the program met its objectives. Six months is a period of time in which the quality of opinion about the utility of a program is likely to be experienced based, and, therefore, of substantially greater value than program-ending predictions of its utility (Nowlen, 1988). Participants' superiors and colleagues can also be surveyed six months later with respect to whether their interactions with the program participant have evidenced the outcomes for which the program was selected.

"By carefully examining shifts in judgement, the continuing educator can discover more precisely the intersection of participant need with program resources, a discovery that leads to greater specificity in program redesign" (Nowlen, 1988, p.155). With respect to performance, however, the most that can be concluded is that there is a correlation between relatively more effective performance and relatively more frequent participation in continuing education. The update model offers a narrow field of vision in which to address performance variables.

Evaluation in the Competence Model

Assessment of the professional in the competence model involves examining both knowledge and skills and the ways in which they are brought into actual performance. Assessment takes many forms including paper and pencil self-assessment batteries; interactive computer-based practice simulations and gaming; the formal processes of an assessment center which combine simulation of decision making under practice-like conditions; and, attentive peer review or performance evaluation (Nowlen, 1988). The assessment and development effort must be individualized so that the professional is not expected to demonstrate competency in areas for which he does not have responsibility. Assessment should be as realistic and meaningful as possible in keeping with the actual situations encountered in the work environment. Assessment materials should be confidential and nonthreatening but reasonably rigorous and engaging so as to provide a reliable assessment of the relationship between practice and competence. Deficiencies, if any, would call for remedial action to be taken on the part of the concerned practitioner. Many disagree over whether ineffectiveness, that is, faults or weaknesses, is easier to identify, more useful to practitioners, and also easier to assess than effectiveness, that is, competencies related to high performance. Change and improvement are generally motivated more by knowledge of problems than by knowledge of success, that is, negative feedback is more conducive to proficiency than positive feedback (Cameron and Whetten, 1983).

Continuing education programs can then be evaluated as to whether participants' learning objectives were met and determine whether learning has been translated successfully into practice related competencies (Nowlen, 1988). Links between competence gains and actual performance can be interpreted by constructing hypotheses about continuing education related shifts in performance proxies, through auditable signs of quality variations in practice, adaptation of certain innovations in protocols, technology, cost reduction, productivity enhancements, organization structure, and the like. Scenarios can be sketched that portray reasonably probable shifts in performance, yet these may only infer evidence of a performance linkage (Nowlen, 1988). There remains a need for better ways to assess competence so that instructors and learners can accurately gauge their progress and so that those responsible for judging an individual's ability to function as a responsible practitioner may do so in a way that is both thorough and objective (Shimberg, 1973).

Evaluation in the Performance Model

No such performance proxies need to be guessed at in evaluating performance-model continuing education. "More often than not, the organizational learning agenda and that of individual professionals spring directly from reliable measures of performance, and positive changes in those reliable measures will be expected educational outcomes" (Nowlen, 1988, p. 158). In the performance model, evaluation of learning occurs within a framework that has already specified the ultimate difference the learning activity is expected to make. The performance objectives of the organization or the individual are the origins as well as the goals of learning activities. There is no need to look to comparisons with university courses or to input criteria as sources of external validation (Nowlen, 1988).

Sometimes the educational strategy itself, carefully coordinated for reinforcement and for integration with current and future responsibilities, is considered sufficient. For organizations, an educational strategy can also be orchestrated with other strategies such as changes in policy, modifications in structure, reallocation of resources, transfers of personnel, and the like. For individuals, an educational strategy usually is coordinated with personal strategies such as self-renewal or new positioning for career advancement in a highly competitive environment (Nowlen, 1988). The educational strategy either makes the intended difference in performance or it does not. If it does not, it may be the result of poor educational design or poor learning performance. Additionally, there may be a more fundamental error about the probability that an educational strategy, by itself or in coordination with other moves, was an appropriate means. Thus evaluation in the performance model can inevitably lead to more sophisticated educational decision making as well as better educational design.

It is conceivable for practitioners to misdiagnose their performance problems, however, and improve different competencies with no observable change in day-to-day performance. Misinterpretations of performance issues and failure to engage in any consultation before selection of an educational remedy, even when such services are readily available, are sometimes the culprits when educational strategies seem to fail (Nowlen, 1988). The periodic formal performance review process offers critically important information if both parties work hard to make it meaningful. With respect to performance model evaluation, it is not difficult to determine

whether a desired level of performance has been achieved. "It can be somewhat more difficult to establish whether continuing education played the intended instrumental role" (Nowlen, 1988, p. 165).

Further Implications for Consideration

In terms of workshop evaluation, the most important implication of the results of Bleuer's 1986 study is that there appears to be little or no correlation between participants' responses to traditional evaluation items and their follow-up application of workshop outcomes. Given this, ratings of usefulness may be somewhat better than ratings of personal gain because, in their responses, participants seem to incorporate the dimension of back-home application with what they learned. It also appears that, even when there has been evidence of knowledge or skill gain, there is no indication that the participant will retain or use the knowledge or skill when he leaves the workshop. Therefore, program decisions should not be based solely on the post-workshop rating of participants. The results of his study also showed that the ratings of workshop quality have little usefulness in terms of providing evidence of workshop effectiveness. For the sake of efficiency, items pertaining to program feedback should focus simply on: "(1) the identification of specific features of the workshop that the participant thought were particularly effective; and, (2) specific suggestions for improvement of aspects that the participant thought were not effective" (Bleuer, 1986, p. 154). This approach may encourage constructive feedback and may help both participants and planners to focus only on the components that need attention.

Although it would be possible to develop evaluation criteria that utilize existing records, standardized tests, and sophisticated observation techniques, such measurement strategies are likely to require more time and resources than are available for most PCE workshop evaluations. Therefore, a careful analysis of the use of self-report measures is probably the most practical approach to improving the measurement dimension of workshop program evaluation. Gronlund (1981, p. 468) points out that:

> The effective use of self-report inventories assumes that the individual is both willing and able to report accurately. Responses can usually be easily faked if an individual desires to present a distorted picture of himself. Even where he wants to be truthful, there is the possibility that his recollection of past events will be inaccurate and that his self-perceptions will be biased.

Finally, Popham (1981, pp. 336-337) distinguishes between low-inference and high-inference self-report devices. Low-inference devices are rather direct in that "the responses require little or no high powered

logic chain to draw a conclusion regarding what they mean." High-inference devices are "more exotic measuring devices... in which we secure data from which we must make pretty hefty logical leaps." He points out that "since the purpose of a low-inference self-report device is relatively transparent, the respondent can readily manufacture answers that are not truthful." However, because of the larger inferential jump necessary for high-inference devices, we may not be sure that the responses "really tell us what we want to know."

Both Popham and Gronlund feel that there are many situations in which respondents will not feel the need to be deceptive and that evaluators can use low-inference devices with a fair amount of confidence in the results. Gronlund suggests that efforts be made to emphasize to the respondents the importance of accurate results. It seems logical that this strategy would be particularly effective with the participants of PCE workshops because having been charged with similar responsibilities in their own jobs, they may readily understand the need for effective program evaluation and may empathize with the program presenters and evaluators.

Continuing Professional Education Operations

Success in programs for professional advancement is neither a natural nor an accidental happening: it can only be the result of studied design. A program is considered successful if it has provided benefits to the practitioner and society which outweigh the costs of educational training. Organizations that create their destiny will be here to achieve even greater service to society. This study is devoted to an attitudes and needs assessment for the development of competency-based continuing professional education within the construction practices as a form of regulatory intervention. Yet, even if one were satisfied that quality assurance in a professional market required some form of regulatory intervention, one would be further faced with the question of how the regulation strategy should be administered and how potential benefits should be measured. It is not the purpose of this study to specifically address such questions; however, due to their relevance to the program's success, a brief discussion of planning and administration, development, and marketing operations is essential.

Program Planning and Administration

The process of developing a regulatory program consists of three stages: (1) introduction, (2) committee, and, (3) implementation. This study suffices those requirements associated with the first stage, that is, continuing professional education is introduced as the sole effective solution to ensure the development of competencies requisite for successful practice. Frantzreb (1981) asserted that administrative success for professional continuing education is "90 percent planning and 10 percent implementation." He identifies numerous success factors of which several include: (1) effective presidential leadership, (2) experienced staff, (3) long-range plans and goals, (4) a motivational case statement, (5) adequate budgets, (6) ongoing research, and (7) supportative communications. Paramount to the success of continuing professional education is the belief in the importance of what the program is to accomplish. Successful program administration is the business of everyone who has a stake in its outcome.

Assessment of the qualifications of practitioners may be at best made by an objective body or organization not composed exclusively of those who have received their credentials. To date, 94 percent of surveyed associations appointed a "task force/committee" to study and investigate regulatory strategies including continuing education. More than 75 percent of the associations revealed that professional competencies or standards were developed prior to the initiation of any regulatory effort and a task force/committee was responsible for the development of these standards or competencies (Gilley, 1985). Specifically, Table 15 shows the distribution of those groups responsible for determining initial and continued competencies for eight professions. As evidenced herein, few professional associations or licensing agencies involve the actual practitioner of the regulated profession. This resentment can be further understood by reviewing the solicited comments of licensed contractors (ref. App. G, p. 156), submitted inconjunction with this study's survey of educational needs and attitudes. Rottenberg (1980) believes another major fault is that regulatory boards in licensed occupations only infrequently include representatives of consumers of the occupation's services. The needs and attitudes of practitioners and consumers cannot be disregarded, and they should drive the development of any regulatory strategy.

Table 15.
Frequency Distribution of Groups Responsible
For the Determination of Professional
Competencies by Type of Association

type of association	a	b	c	d
Business	5	5	1	3
Education	10	3	0	8
Service	3	5	1	1
Trade	12	4	1	4
Medical/Health	4	2	0	1
Engineering	4	3	0	2
Finance	1	1	0	1
Agriculture	1	1	0	1
totals	40	24	3	21

a=Task Force/Committee b=Board of Directors c=Membership d=Other

Source: Gilley, 1985, p. 90

During the committee stage, essential questions are addressed which include

1. Who is the best qualified to define the competencies?
2. How can the list of competencies be validated?
3. What standard will be established for evaluating applicants against the list of competencies?
4. What assessment procedures will be used to evaluate persons who apply for both initial licensure and relicensure?
5. Will current practitioners be responsible for new requirements?
6. How will the certification program be financially supported? (Gilley, 1985, p. 133)

If all relevant questions are addressed in this stage, regulatory agencies and professional associations can effectively and efficiently implement their intervention efforts. Additionally, all policy-making functions

should be kept as independent as is feasible from influence by a parent or related agency whose functions include promoting the economic well-being of the agency. By following this three stage approach, regulatory agencies can reduce ambiguity and frustration created by uncertainty and doubt.

Program Development

Continuing education administrators have been breaking new ground in advancing the knowledge and techniques of fund raising. Seymour (1986, p. 116) states, "No longer is development either casual or occasional as it usually was some forty years ago. Nor is it a minor and relatively ignoble function, to be seen and heard only when the need for its fruits becomes obvious, desperate, and demanding." Presently, continuing education agencies are expected to be primarily self-supporting through the fees charged the attending students. "While cost recovery from fees has been used as a reason for not seeking external support," Millner believes, "it is in fact a necessary reason for doing so" (1986, p. 45). With the rapidly declining federal and state support of past years, continuing education must explore the possibilities of private sector funding to augment existing cost recovery through participant fees.

Development is a comprehensive approach to fund raising and friend raising in which the institution analyzes its position in the market place, identifies its needs, cultivates donor sources best matching its needs, and implements solicitation programs that are best suited for the targeted donor group (Kotler and Fox, 1985). If continuing education agencies are to be successful in tapping private funding sources, administrators must establish development operations that can achieve their funding goals. Successful operations have allowed associations to provide better quality programs and more opportunity than would have been possible with financial resources derived solely from other sources. It is not possible to provide a good mixture of programming when student fees must pay the entire cost.

Data from the National Center for Education Statistics showed that 56.3 percent of continuing education participants pay for their education, employers finance 27.0 percent and public funds pay 16.7 percent (Loring, 1980). Whereas deans and directors maintain allocated expenditure budgets, continuing education administrators have "inherited the responsibility for resource acquisition and must meet it if their programs are to prosper or even survive" (Beder, 1984, p. 5). The continuing education administrator cannot rely on hunches and personal experience, but must structure a successful development operation that will contribute to

continuing education accomplishing its mission. It has been their resource insecurity that has made it necessary for administrators to begin to look for private support due to an environment in which program administrators must

1. Acquire a good share of their operational resources.
2. Serve a dynamic market, for another unique feature of continuing education is that its goals and methods derive not from the educational system but from the learning needs of individuals and organizations. (Beder, 1984)

"External resource development in continuing education has been identified as an important part of financial support for continuing education agencies" (Millner, 1986, p. 53), yet there presently exists a limited quantity of information which identifies key components for establishing successful development operations in continuing education. As a result, Millner states that the majority of continuing education providers still have not developed active development operations by 1985. There may be similarities with other higher education development efforts, but the unique characteristics of continuing education will have to be considered in determining and adopting the characteristics, conditions, development activities and sources of funds that contribute to the success of development operations. Millner believes:

> Every continuing education development agency, regardless of its organization profile, can shape a development operation that incorporates the critical components of successful development operations in continuing education. Any continuing education agency can develop a successful development operation if the unit is willing to plan and organize appropriate development activities. (1986, p. 110)

Millner's most notable objective in his 1986 study was to determine those conditions that influence successful continuing education development operations. A summary of his findings citing the ten most influential conditions are presented in Table 16.

Millner (1986) attempted to determine the critical characteristics, conditions, development activities and sources of gifts that have contributed to the success of continuing education development operations, according to continuing education administrators of the active development operations. He selected continuing education agencies with active development operations because they were most likely to have insights concerning the critical components for successful fund raising in continuing education. Those critical conditions leading toward a successful development operation have been previously stated. Millner's

Table 16.
Sum of the Individual Weighted Rankings and Assigned Rank Order for Conditions that Influence Successful Continuing Education Development Operations

conditions	sum of the individual weighted rankings	rank order
Develops people-oriented programs and causes lend themselves readily to resource and fund development	97	1
Has activities which are centered on specific ideas or causes	55	2
Has an organized and defined planned effort at fund raising and resource development, involving the president and the industry	51	3
Establishes programs to involve community leaders	50	4
Has an alumni association	37	5
Has a clear statement of purpose for the development operation	36	6
Conducts development activities in a "low key" manner	33	7
Has a professional person that works with the president to establish fund raising plans	30	8
Has an annual funding activity	27	9
Involves the formal and informal power structure of the industry	26	10

Source: Millner, 1986, pp. 65-66

additional significant input to development research has been an analysis of activities determined to contribute to financial independence. Planning and implementation of developmental activities should therefore reflect these results stated in Table 17.

Program Marketing

Educators in almost all institutions have been product marketers, believing that their services would be in demand because education is inherently good. Persistence in this belief has put many educational institutions in an undesirable position. Continuing education managers have been more convinced than their

Table 17.
Sum of the Individual Weighted Rankings and Assigned Rank Orders for Development Activities for Successful Continuing Education Development Operations

development activities	sum of individual weighted rankings	rank order
Personal solicitation	108	1
Special events/projects	83	2
Joint programs/seminars with business and industry	66	3
Direct mail	59	4
Foundation proposals	54	5
Annual fund	43	6
Community programs	28	7
Telephone campaign	23	8
State/Federal grant proposal	21	9
Estate planning	17	10

Source: Millner, 1986, p. 69

counterparts in the field of traditional higher education of the need to inform prospective clientele of available educational opportunities. Many realize that such information can be conveyed if it is presented as one part of a larger, comprehensive marketing strategy. This strategy should include not only the use of promotional techniques, but should rely also on designing the organization's offerings in terms of the target market's needs and desires (Brown, 1985). "The aim of marketing is to make selling superfluous. The aim of marketing is to know and understand the customer so well that the product or service fits and sells itself" (Drucker, 1974, p. 64). Philip Kotler, the Harold T. Martin Professor of Marketing at Northwestern University and the first important author on marketing for nonprofit organizations, points out that Drucker's statement does not imply

that selling and promotion are unimportant, but that they are part of a larger set of marketing tools "that must be orchestrated for maximum impact on the marketplace" (Kotler, 1983, p. 6). Kotler's definition of marketing indicates clearly that there is more to the process than mere selling:

> Marketing is the analysis, planning, implementation, and control of carefully formulated programs designed to bring about voluntary exchanges of values with target markets for the purpose of achieving organizational objectives. It relies heavily on designing the organization's offering in terms of the target markets' needs and desires, and on using effective pricing, communication, and distribution to inform, motivate, and service the markets. (1982, p. 6)

Differences between business and education exist which must be understood and addressed if marketing is to offer long-range benefits. The philosophical missions of education transcend the demands of the consumer and urge colleges and universities to pursue goals that may be unresponsive to contemporary trends. The contributions of professional education, unlike a garment manufacturer that can replace a clothesline every season, must extend far into the future. The education industry tends toward goals promoting social responsibility, cultural enhancement, applied research, dissemination of information, and innovation, thus they find meaning and substance through influencing societal trends and national policies (Mitchell, 1981). Education is also subject to federal regulation and public pressure in a way in which private business is not

There has actually been a reluctance on the part of some adult educators to convey information about continuing education to the general public. "They have tended to equate the dissemination of educational information with commercial advertising" (Brown, 1985, p. 6). There was assumed to be little need for merchandising adult education since a huge audience was already thirsting for participation, and adults should enroll without question in courses which were offered to them because continuing education providers always know what is best for participants. Kotler (1982) indicated several reasons institutions of education might be reluctant to install a marketing function which include

1. Some organizations might be contemptuous of the notion that education has to be marketed.
2. Some organizations might feel that marketing is everyone's job and if a marketing director is appointed, everyone in the organization will sit back and expect him or her to miraculously solve their problems.
3. Some organizations feel that they are getting all the marketing they need from the director of public relations.

4. It is always better to hire marketing expertise as needed from advertising agencies.

5. Some organizations feel that they are too poor to afford a marketing function.

Buchanan and Barksdale (1974) state that continuing education administrators "need to become master craftsmen of marketing techniques in order to effectively manage the transactions they are responsible for. This is becoming more essential as the external pressures increase... for example, the fluctuation of federal funds, the push for accountability, and the growing demand for educational opportunities" (pp. 44-45). The extensive variety and abundance of professional continuing education agencies now clamoring for new clientele have placed themselves in a competitive stance. Many will have to find more effective ways to disseminate information about their programs and services if they wish to survive and grow. By knowing the effective use of marketing communication techniques on organizational performance, continuing education administrators can make better-informed decisions regarding the appropriate use of these techniques in communicating with and providing information for potential professional participants. Kotler and Levi (1969) state that traditional marketing principles are transferable to the marketing of organizations, persons, and even ideas. Compton (1980) indicates that the administrators of successful continuing education programs contacted in her study perceive a strong, positive relationship between marketing practices and the success of their programs.

A major conclusion of a study by Howard (1977) was that continuing education marketing research has used a very limited number of available techniques. He recommends that research be more comprehensive and that continuing education programs not only establish marketing research units, but that they also utilize planning, analysis, and research techniques adapted from business marketing research. Continuing education practitioners and theoreticians often approach spheres of interest from different directions and with regard to totally different premises. Practitioners are frequently overly concerned with survival, theoreticians are often concerned only with research, yet they each are important to the other. Without research it is difficult to establish a base for practice, and without successful practice it is difficult to validate research. Continuing education marketing literature appears to emphasize either general marketing theory or specific market-oriented recruitment techniques. Brown is convinced that a need exists to develop a comprehensive master marketing strategy that assimilates the general principles of both theory and practice into a single planning document. Such

a document should be concise, easily comprehensible, practical, flexible enough to be applicable to almost any continuing education program, and designed with the purpose of assisting adult educators in conducting efficient and effective marketing campaigns. In Brown's revised model the marketing activity has been divided into three major operations: (1) research (steps 1-9); (2) marketing strategy (steps 10-22); and, (3) evaluation (steps 23 & 24). In essence his model is an annotated check list, a step-by-step sequence of strategies for developing and carrying out a marketing program.

Managing a continuing education agency is such a many-faceted, time-consuming activity that a marketing model which would simplify complicated operation should be welcomed. This model is iterative, in that the last step in implementing the marketing model is evaluation, which should continually lead the administrator through the model for adjustments and corrections. The only valid basis for evaluation is the program's own objectives because the ultimate goal of any regulatory strategy is the protection and promotion of society's interests.

Table 18.
Continuing Education Marketing Model

step	description
1	Review the general characteristics of the adult learner.
2	Review the characteristics of the students currently enrolled in the agency involved in promotion.
3	Review the characteristics of accepted non-matriculated students.
4	Conduct attrition studies.
5	Study institutional philosophy and mission in the light of their likely influences on promotion.
6	Examine institutional public relations policies in light of likely influences on promotion.
7	Inventory personnel resources of the institution.
8	Inventory physical resources.
9	Review the institution's significant past accomplishments.
10	Select an appropriate pattern of market coverage (market segmentation).
11	Choose an appropriate competitive position.
12	Review the institution's own programs.
13	Assess needs of the community.
14	Formulate a counseling service appropriate for adults.
15	Consider packaging options.
16	Acquire competent program facilitators.
17	Select appropriate marketing channels for each program.
18	Build the promotional budget.
19	Establish promotion schedules.
20	Determine fees to be paid by participants.
21	Determine at what location the program will be offered.
22	Schedule programs.
23	Evaluate programs.
24	Evaluate marketing techniques.

Source: Brown, 1985, p. 106.

CHAPTER 3
REGULATION OF PROFESSIONALS

Overview

Theoretical options available for professional regulation have been previously discussed in Chapter 2. Chapter 3 presents specific regulatory requirements currently employed for professions pertinent to this study. State policy makers have determined the extent of intervention required and further discussion of their reasoning processes is therefore not necessary. The regulatory characteristics for those states maintaining a state certification program for contractors are presented first, followed by an overview of requirements for various regulated occupations in the state of Florida.

Regulation of the Construction Industry

The objectives of this study cannot be met without an understanding of the regulatory requirements of those states maintaining statewide certification. Presently, only 24 states license contractors to operate throughout their respective state. The remaining 26 states do not conduct regulatory practices or do so on smaller, local levels. Construction licensing laws were first introduced in North Carolina in 1925 and have still been established as recent as 1985 in Virginia. This may indicate that statewide regulatory principals are presently under investigation in other states. Professor Arlan Toy, of the University of Florida's School of Building Construction, has researched current regulatory requirements for contractors throughout the United States. A synopsis of only those requirements pertinent to this research study have been included herein in tabular format. The following are conclusive trends drawn from Toy's 1988 unpublished study:

1. Only 25 percent of the states have established a grandfather clause.
2. All 24 states license an individual.

3. Only 33 percent of the states prepare and administer a certification exam in-house.

4. Only 38 percent of the states require a minimum value of working capital.

5. The majority of states (63 %) require professional references as an entry qualification, and only 7 percent of those states requiring references do not verify their authenticity.

6. Summary of knowledge tested on certifying exams is:

   a. 46 percent test contract administration.
   b. 46 Percent test business and finance.
   c. 33 percent test project management.

7. No state presently requires continuing education as a condition for relicensure.

8. Two states do require a recertification exam as a condition for relicensure.

Table 19 provides a detailed presentation of the history, organization, and both entry and relicensure requirements for those 24 states which maintain a statewide regulatory strategy.

Regulation of Other Professionals in Florida

Current regulatory requirements for various professions in the state of Florida have been investigated with particular attention directed to those requiring continuing professional education as a condition for relicensure. Information was obtained from the present *Catalog of Regulated Occupations in Florida.* Only two general trends are noted: (1) continuing professional education requirements vary linearly with initial occupational education requirements for entrance into an occupation; and, (2) most regulated occupations sampled maintain a conditional clause requiring continuing education if one has become inactive in their occupation for a specified duration. Detailed requirements for thirteen regulated occupations are presented in Table 20. These occupations were specifically selected due to their frequent occurence in CPE literature. As a result, inferences can be assembled for further discussion incorporating the analyses from others' published research.

Table 19.
Regulation of Contractors in All States

	states											
	AL	AK	AZ	AR	CA	DE	FL	HI	LA	MD	MA	MI
History: First (Funct.) Yr.												
Licensing Law 19..	35	68	31	64	30	69	68	57	55	27	81	66
Grandfather Clause	No	No	*	No	No	No	No	No	Yes	No	Yes	Yes
Examination 19..	No	No	31	88	30	0	68	57	56	0	82	66
License Holder:												
Qualifying Agent	No	Yes	No	Yes	Yes	Yes	Yes	Yes	No	No	No	Yes
Business Entity	Yes	Yes	Yes	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes
Individual	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Organization Board:												
Number of Members	5	*	*	8	13	*	23	13	12	*	11	9
Selection:												
Governor	Yes	*	*	Yes	Yes	*	Yes	Yes	Yes	*	Yes	Yes
Elected	No	*	*	No	No	*	No	No	No	*	No	No
Exam Services:												
In-House Prep.	No	No	Yes	No	Yes	No	No	No	Yes	No	Yes	Yes
Entry Requirements:												
Years of Experience	0	0	4	5	4	0	4	4	0	0	5	0
Financial:												
Net Worth	Yes	No	Yes	Yes	*	No	Yes	Yes	Yes	No	No	No
Credit Rating	Yes	No	Yes	No	*	No	Yes	Yes	Yes	No	No	Yes
Working Capital	Yes	No	Yes	Yes	*	No	Yes	No	No	No	No	No
Bankruptcy	Yes	No	Yes	Yes	*	No	Yes	Yes	Yes	No	No	Yes
License Bond	No	Yes	Yes	No	Yes	Yes	No	Yes	Yes	No	No	No
Public Liability Insur.	No	Yes	No	No	*	No	Yes	Yes	Yes	No	No	No
Moral:												
Criminal Conviction	Yes	No	Yes	No	*	No	No	No	Yes	No	No	Yes
References	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	No	No	Yes
Verified References	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	No	No	No
Exam:												
Task Analysis Base	No	No	Yes	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes
Content:												
Bus./Financial	No	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Contract Admin.	No	No	Yes	No	Yes	No	Yes	Yes	Yes	No	Yes	Yes
Project Mgt.	No	No	Yes	No	No	No	Yes	Yes	Yes	No	No	No
Re-Licensing Criteria:												
Payment of Fee	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
License Bond Verif.	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes	No	No	No
Liability Insurance Verif.	No	Yes	*	No	No	No	Yes	Yes	Yes	No	No	No
Cont. Ed. Requirement	No	No	No	No	No	No	No	No	No	No	No	No
Re-Certification Exam	No	No	No	No	No	No	No	Yes	Yes	No	No	No
Not in Bankruptcy	Yes	No	*	Yes	*	No	Yes	Yes	Yes	No	No	Yes
Not Under Crim. Sent.	Yes	No	No	No	No	No	No	Yes	No	No	No	Yes
Not Under Board Discipline	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes

Table 19. – continued

	states											
	MS	NV	NJ	NM	NC	ND	OR	SC	TN	UT	VA	WA
History: First (Funct.) Yr.												
Licensing Law 19..	50	41	77	*	25	37	72	30	31	57	85	63
Grandfather Clause	Yes	No	No	*	No	No	No	No	No	Yes	Yes	No
Examination 19..	83	65	No	*	50	No	No	30	86	60	85	No
License Holder:												
Qualifying Agent	No	No	No	Yes	Yes	Yes	No	Yes	No	No	Yes	Yes
Business Entity	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Individual	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Organization Board:												
Number of Members	7	7	*	9	7	*	5	9	7	5	9	*
Selection:												
Governor	Yes	Yes	*	Yes	Yes	*	Yes	Yes	Yes	Yes	Yes	*
Elected	No	No	*	Yes	No	*	No	No	No	No	No	*
Exam Services:												
In-House Prep.	Yes	No	No	No	Yes	No	No	No	No	No	Yes	No
Entry Requirements:												
Years of Experience	0	4	0	4	0	0	0	3	3	4	0	0
Financial:												
Net Worth	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	No	Yes	No
Credit Rating	No	Yes	No	Yes	Yes	No	No	No	No	No	No	No
Working Capital	Yes	Yes	No	Yes	Yes	No	No	No	Yes	No	No	No
Bankruptcy	Yes	Yes	No	Yes	Yes	No	No	No	Yes	No	Yes	No
License Bond	No	Yes	No	Yes	No	Yes	Yes	Yes	No	No	No	Yes
Public Liability Insur.	No	No	No	No	No	No	Yes	Yes	No	No	No	Yes
Moral:												
Criminal Conviction	Yes	Yes	No	Yes	Yes	No	No	No	Yes	Yes	No	No
References	Yes	Yes	No	Yes	Yes	Yes	No	Yes	Yes	Yes	No	No
Verified References	Yes	Yes	No	Yes	No	Yes	No	Yes	Yes	Yes	No	No
Exam:												
Task Analysis Base	Yes	Yes	No	Yes	Yes	No	No	Yes	Yes	Yes	No	No
Content:												
Bus./Financial	Yes	Yes	No	No	No	No	No	Yes	No	Yes	No	No
Contract Admin.	Yes	Yes	No	No	No	No	No	Yes	No	Yes	No	No
Project Mgt.	Yes	Yes	No	No	No	No	No	Yes	No	Yes	No	No
Re-Licensing Criteria:												
Payment of Fee	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
License Bond Verif.	No	Yes	No	Yes	No	No	Yes	No	No	No	No	Yes
Liability Insurance Verif.	No	No	No	No	No	No	Yes	No	No	No	No	Yes
Cont. Ed. Requirement	No	No	No	No	No	No	No	No	No	No	No	No
Re-Certification Exam	No	No	No	No	No	No	No	No	No	No	No	No
Not in Bankruptcy	Yes	Yes	No	Yes	No	No	Yes	No	Yes	No	No	No
Not Under Crim. Sent.	Yes	Yes	No	Yes	No	No	No	Yes	No	No	Yes	No
Not Under Board Discipline	No	Yes	No	Yes	No	Yes	Yes	Yes	Yes	Yes	Yes	No

* Requested information not received
Source: Toy, 1988

Table 20.
Professional Certification Grid For Selected Occupations In Florida

job	a	b	c	d	e
Accountant	X	X		X[1]	
Architect	X	X	X	X[2]	
Attorney/Lawyer	X	X			
Contractor		X	X	X[3]	X
Contractor, Electrical		X	X	X[2]	
Engineer, Professional	X	X	X	X[2]	
Nurse, Registered	X	X		X[4]	
Optometrist	X	X		X[5]	
Pharmacist	X	X	X	X[6]	
Physician	X	X	X	X[7]	
Physiologist	X	X	X	X[8]	
Real Estate Broker		X	X	X[9]	
Teacher, Academic	X	X	X	X[10]	

Legend:
a = Must graduate from an accredited school.
b = Must pass an official test or examination.
c = Must have completed a supervised internship/experience.
d = Must participate in continuing education for relicensure.
e = Reciprocity from other states.

1. 64 hours/2 years
2. Only required to reactivate an inactive license at 12 hours/year of inactive status
3. Only required for asbestos abatement contractors
4. 24 hours/2 years
5. 28 hours/2 years with 10 hours in transcribing
6. 15 hours/1 year
7. 60 hours/3 years with 5 hours in risk management
8. 40 hours/2 years
9. 14 hours/2 years with 3 hours in core/law
10. 6 semester hours/5 years

Source: FL Occupational Information System (1987)

CHAPTER 4
METHODS AND PROCEDURES OF ANALYSIS

Research Design

This study investigates the feasibility of implementing a continuing professional education program for licensed contractors in the state of Florida. If an education program is not to be implemented, this study should assist professional associations and other concerned parties in serving the educational needs of the construction industry. The specific objectives of the study were previously outlined in Table 2 (ref. p. 4)within the Purpose of the Study.

After reviewing the existing literature and other sources of information, it was determined that available information was not sufficient to respond to all objectives of this study. Consequently, data would have to be collected by means of a survey or questionnaire. Data collected from the construction practices covering the following research items was necessary to satisfy all proposed objectives:

1. Attitudes toward mandatory continuing education.
2. Attitudes toward mandatory continuing education for reactivation of inactive status.
3. Distribution of continuing education courses taken during the previous two-year period.
4. Reasons for participation in continuing education.
5. Attitudes toward whom should participate in continuing education.
6. Attitudes toward mandating continuing education in other fields.
7. Orientation of continuing education's primary role.
8. Desired educational topics or content.
9. Attitudes toward preferred continuing education activity format or presentation.
10. Attitudes toward preferred continuing education activity duration.

11. Distribution of the number of suggested mandatory continuing education courses to be taken per two-year period.

12. Attitudes toward preferred continuing education activity location.

13. Attitudes toward preferred continuing education activity cost.

14. Solicitation of comments or suggestions from current licensees on this research subject.

Mail, telephone, and personal survey methods were first reviewed and it was initially concluded that personal survey would be employed by means of a roundtable discussion. This procedure would have permitted in-depth questioning when necessary, further clarification of responses, and the opportunity to obtain unsolicited information from those being interviewed. Planned meetings were scheduled at major regional locations throughout the state of Florida. Invitations were distributed through various chapters of the Associated General Contractors (AGC) in an attempt to provide a sample population of 400 licensees per meeting. After less than a 3 percent turnout at the first roundtable meeting held in Tampa-St. Petersburg and with no licensees showing at a second attempt in Jacksonville, further attempts using this sampling method were discontinued.

Although variation in data exists, a recognizable pattern can be found in many cases if proper sampling procedures are followed. The previous sample was not of an adequate size to indicate any conclusive trends. Therefore, a mail questionnaire was designed with both factual and attitudinal questions to collect data for determining potential patterns in the research items previously listed. Categorical, open-ended, continuous, and funneling formats of questions were all explored to optimize data interpretation and to facilitate respondent submission of the survey. Finally, several general variables were included to permit alternative analysis based upon: (1) construction field, (2) period license held, and (3) location within the state. The resulting survey of continuing education needs for licensed contractors in Florida is included in Appendix D.

Description of the Study Population

The target population in this study consists of all state-certified contractors in the state of Florida. According to the *1987 Catalog of Regulated Occupations in Florida*, there are presently 32,994 certified contractors permitted to practice state-wide constituting the following construction fields: (1) air-conditioning,

(2) building, (3) electrical, (4) general, (5) mechanical, (6) pool, (7) residential, (8) roof, and (9) sheet-metal. Due to the size of the target population, a census was deemed not feasible, as is the case with most large target populations because of cost and time constraints.

Because the total size of each licensed construction field varies within 0.2 percent and 52.8 percent of the overall target population, a simple random sample may not accurately represent the target population of all state-certified contractors. To avoid introducing potential errors resulting from this situation, a stratified, systematic sampling approach was employed to best represent the target population. The target population was divided into strata based upon the respective license type; then, a systematic sample was obtained by starting at a random position and selecting every nth element from the target population until the desired sample size was complete. Cost constraints confined major distribution of the questionnaire, and, hence, limited the sample population to one-thousand certified contractors. The maximum sample size, in turn, defined the systematic selection to every thirty-third licensee within each field. Information pertaining to the distribution of the questionnaires and their return are presented in Table 21.

Table 21.
Distribution and Return Rate of Questionnaires and Data Collection

license type	strata sample size	systematic sample distribution	absolute response	relative response
Air-condition.	1,988	61	9	14.8%
Building	5,696	173	29	16.8%
Electrical	729	22	4	18.2%
General	17,436	528	66	12.5%
Mechanical	583	18	3	16.7%
Pool	630	19	4	21.1%
Residential	4,845	147	23	15.6%
Roofing	999	30	1	3.3%
Sheet metal	78	2	1	50.0%
N/A[1]	–	–	18	1.8%
total	32,994	1,000	158	15.8%

1. Represents responses received without indication of license designation

All licensee information was obtained from a complete listing of all state certified and state registered contractors as compiled by the Department of Professional Regulation and cross-referenced with the *Contractor's Bluebook, Florida Edition, 1988* where possible. Despite this tedious attempt to ensure current sampling information, approximately 25 percent of the distributed survey questionnaires were returned due to incorrect or outdated addresses. An effective response rate of 21 percent was realized when disregarding the returned surveys from the sample population.

Procedures Used for Data Analysis

Analysis of the data was primarily restricted to a quantative presentation of results. This approach was believed to best explore current attitudes and trends for reporting the educational needs of licensed contractors. Additionally, data collected in the literature review was consistently reported in this same manner, therefore facilitating comparisons among studies. All data was input into a database from which results could be manipulated according to established variables designed into the survey. More precise statistical methods were employed only to assist in the explanation of results with extreme variations among licensed fields. Each research question underwent separate analysis and collectively are presented in Chapter 5.

CHAPTER 5
ANALYSIS AND INTERPRETATION OF THE DATA

Overview

The determination of trends and attitudes of licensed contractors toward implementing a mandatory continuing education program as a condition for relicensure were the primary thrust of this research and feasibility study. Presented in this chapter are demographics of the sample population, analysis of the data collected from the survey respondents and summary of the findings.

Demographics of the Survey Population

The variables pertaining to demographics consisted of three responses concerning: (1) construction field; (2) period license held; and, (3) county or state where licensee is registered. Demographic results are provided in Tables 22, 23, and 24.

Table 22.
Construction Field of Licensees Responding

field	absolute frequency	relative frequency[1]
Air-condition.	9	5.7 %
Building	29	18.4 %
Electrical	4	2.5 %
General	66	41.8 %
Mechanical	3	1.9 %
Pool	4	2.5 %
Residential	23	14.6 %
Roofing	1	0.6 %
Sheet-metal	1	0.6 %
N/A[2]	18	11.4 %
total	158	100 %

1. Relative frequency calculated with respect to absolute frequency total
2. Represents responses received without indication of license designation

Table 23.
Years License Held of Licensees Responding

years	absolute frequency	relative frequency
1	1	0.6 %
2	2	1.3 %
3	3	1.9 %
4	3	1.9 %
5	3	1.9 %
6	6	3.8 %
7	6	3.8 %
8	14	8.7 %
9	6	3.8 %
10	17	10.9 %
11	4	2.5 %
12	16	10.1 %
13	4	2.5 %
14	5	3.2 %
15	16	10.1 %
16	7	4.4 %
17	5	3.2 %
18	3	1.9 %
19	1	0.6 %
20	10	6.3 %
25	2	1.3 %
26	1	0.6 %
28	1	0.6 %
30	2	1.3 %
33	1	0.6 %
42	1	0.6 %
43	1	0.6 %
N/A[1]	17	10.9 %
total	158	100 %

1. Represents responses received without indication of period license held

Table 24.
County or State From Which Responses Received[1]

county or state	absolute frequency	relative frequency	county/FL ratio[3] reporting units
Alabama	1	0.6 %	–
Alachua	3	1.9 %	1.3 %
Brevard	5	3.2 %	3.1 %
Broward	13	8.3 %	10.0 %
Charlotte	1	0.6 %	0.8 %
Collier	2	1.3 %	1.7 %
Dade	19	12.1 %	11.6 %
Duval	14	8.7 %	5.2 %
Escambia	2	1.3 %	2.0 %
Gadsden	1	0.6 %	0.2 %
Hillsborough	12	7.6 %	6.5 %
Indian River	5	3.2 %	1.0 %
Lake	4	2.5 %	1.1 %
Lee	6	3.8 %	3.5 %
Leon	2	1.3 %	1.6 %
Levy	2	1.3 %	0.2 %
Manatee	1	0.6 %	1.6 %
Marion	2	1.3 %	1.5 %
Martin	2	1.3 %	1.3 %
Nassau	1	0.6 %	0.3 %
North Carolina	1	0.6 %	–
Okaloosa	1	0.6 %	1.5 %
Orange	6	3.8 %	5.6 %
Pinellas	6	3.8 %	6.8 %
Polk	6	3.8 %	2.8 %
St. Johns	2	1.3 %	0.5 %
St. Lucie	1	0.6 %	1.1 %
Sarasota	3	1.9 %	3.3 %
Seminole	1	0.6 %	2.1 %
Volusia	4	2.5 %	2.7 %
N/A[2]	20	12.7 %	–
total	158	100 %	80.8 %

1. No systematic sampling method applied to location
2. Represents responses received without indication of location
3. Represents the average number of reporting units (establishments) in each county with respect to the total in Florida

Analysis of Data

Data presented in this section represent the quantative and statistical analysis conducted in addressing the research objectives first posed in Chapter 1. Detailed analysis follows in accordance with the format employed in the survey questionnaire. The absolute responses to the survey of continuing education needs for licensed contractors in Florida are provided in (ref. App. H, p. 161).

Research Question 1

Should there be a mandatory continuing education program for all licensed contractors to renew their license?
___ Yes ___ No

Research question 1 was intended to respond to the categorical and funneling needs of this study. First, Question 1 categorizes those licensees who agree or disagree with mandating continuing education as a condition for relicensure. Second, a negative response to Question 1, in conjunction with the same response to Question 2, shall funnel or disclude the respondent from answering the remaining research questions. The intent was to facilitate submission of the survey from the licensee who opposes an educational program, and to determine the educational needs from the licensee supporting such a program who is willing to take the time to accurately submit his opinions and attitudes. No other attempt could be made to ensure validity of the responses.

Contractors, as a whole, are strongly opposed to mandating continuing education as a condition for relicensure. Only 24.7 percent of the 158 respondents favor the implementation of a continuing education program. Disregarding the stratification of each field, only 28.9 percent of the sample population would still support mandating continuing education. However, by examining the results considering each licensed field separately, large variations appear as evidenced by a very high standard deviation of 23 percent. The survey's responses have been segregated according to the distinct licensed construction field and are presented in Figure 7. The construction fields which responded negatively at a lower percentage than the overall rate include (1) sheet metal (0.0 %); (2) roofing (0.0 %); (3) residential (17.4 %); (4) building (20.7 %); and, (5) general (21.2 %). Those fields which responded positively at a higher percentage than the overall rate include (1) pool (75.0

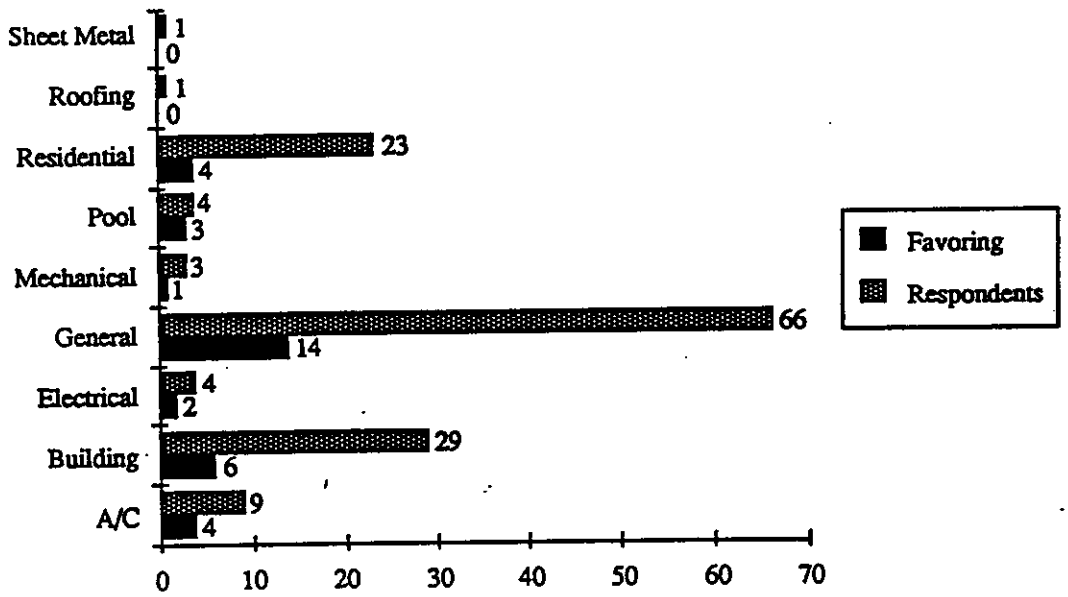

Figure 7. Analysis of Attitudes Toward Mandatory Continuing Education By Type of Certified License.

%); (2) electrical (50.0 %); (3) air conditioning (44.4 %); and, (4) mechanical (33.3 %). Those licensees not indicating their field are also above the overall average by 3.1 percent.

Research Question 2

If your answer above is no, should continuing education be required to reactivate a contractor's inactive status?

___ Yes ___ No

Contractors are presently willing to accept mandated continuing education to reactivate an inactive license to an active status. A much larger percentage (62.0 %) agree to this condition with less extreme variations noted among each field's attitude. All but one field (sheet metal) tend towards the overall average having ranges from 56.5 percent to 100.0 percent and a standard deviation of 19.0 percent. Responses have been segregated as in question 1 with the results respectively illustrated in Figure 8.

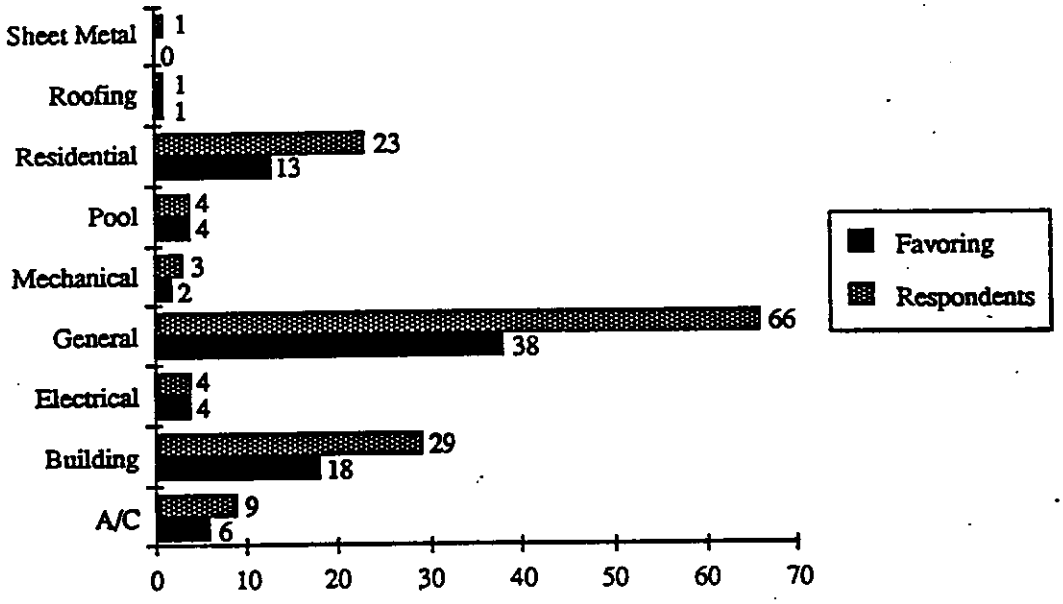

Figure 8. Analysis of Attitudes Toward Mandatory Continuing Education For Reactivation of Inactive Status By Type of Certified License.

Research Question 3

How many continuing education activities have you attended in the last two year period?_____

Question 3 is of a continuous format with its purpose to determine the number of continuing education activities a licensee has recently taken. No attempt was made to determine the number of CEU's accumulated throughout one's career, the content of any courses taken, nor the location, cost, and duration of each course. The objective was to determine a frequency distribution of the number of courses attended, not an accumulation of prior data when the purpose of this study is to assess present and future needs. The skewed distribution of courses previously taken within the last two-year period is apparent in Figure 9.

Contractors do not appear to attend continuing education courses. The average number of courses previously taken is 1.4 per biannium for all respondents. Most licensees, 46.2 percent, have attended no courses in the last biannual period as evidenced by the single peak. A significant portion (39.0 %) have attended between one and three courses, whereas only a very small percentage (3.8 %) of contractors have attended over five continuing education activities.

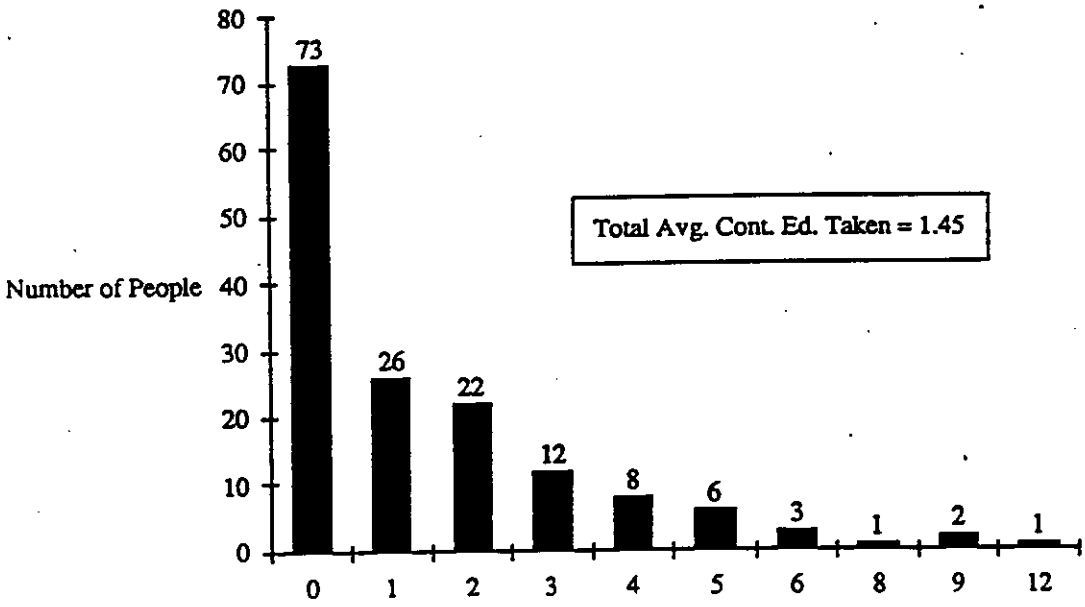

Figure 9. Frequency Distribution of Continuing Education Courses Taken Within the Last Two-Year Period.

Research Question 4

Please indicate the basic reason(s) below which was or would be important to you in deciding to participate in a continuing education activity.

___ Self-satisfaction
___ Increase proficiency
___ Immediate practical benefit
___ Exchange thoughts with associates
___ Keep up with competition
___ Mandatory
___ Other _____

Question 4 is the first in a series of open-ended questions which dominate the remainder of the survey. No attempt was made to limit the number of responses because any licensee may hold multiple attitudes. This question is also the first where those responding negatively to both Questions 1 and 2 have been excluded from expressing their opinions. The remainder of the analysis is devoted to evaluating attitudes and determining needs of those contractors who believe a continuing education program should be implemented either as a condition for relicensure or to reactivate an individual's license to active status. Due to this exclusion, the survey population has been reduced from 158 to 98 respondents for questions 4 through 13.

On the average, each contractor contributed approximately two primary reasons for desiring to attend a continuing education course. The motive to increase proficiency received twice the responses of any other reason. Three motives are grouped closely amongst another, and the remaining reasons do not play a significant

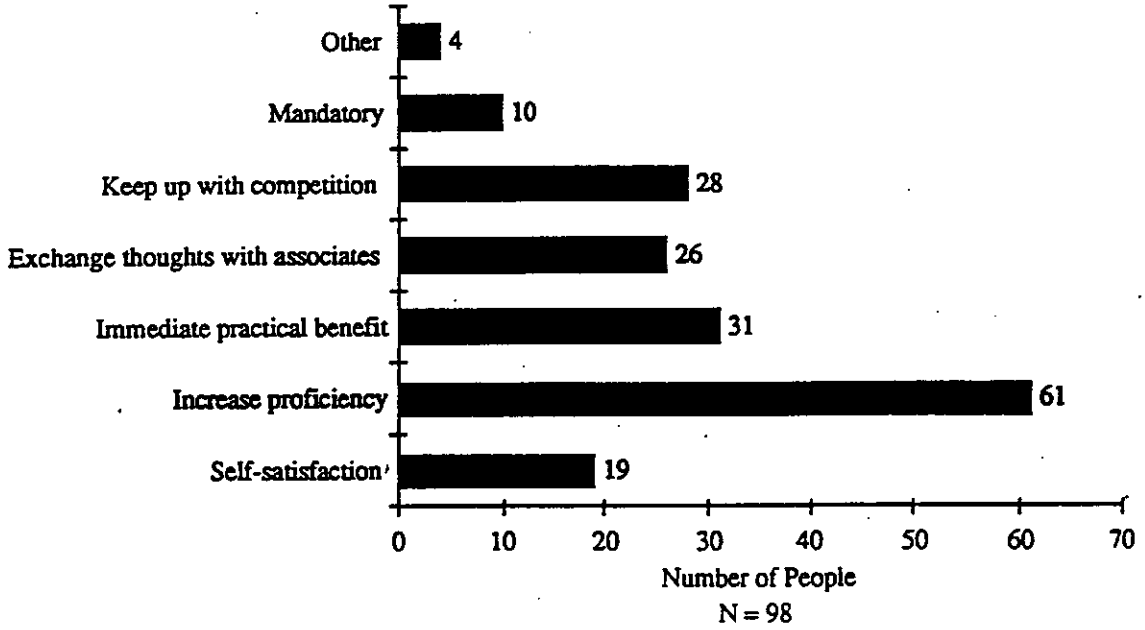

Figure 10. Analysis of Very Important Reasons For Participation In Continuing Education.

role in one's motives towards participation. Figure 10 shows the quantitive analysis of important reasons for participation in a continuing education activity.

Research Question 5

What member(s) within the construction organization do you believe should participate in continuing education?

___ Licensee
___ Project Engineer
___ Project Manager
___ Superintendent
___ Other _____

Contractors overwhelmingly believe (82.7 %) that the licensed individual should be the member of the organization to participate in continuing education. As in question 4, this question at issue received two responses from each licensee. Responses were nearly equally divided as to whether the project manager (43.9 %) or the superintendent (40.8 %) should participate, and to a lesser extent, respondents believed the project engineer (30.6 %) should attend educational activities. The absolute frequency of all responses are totaled in Figure 11.

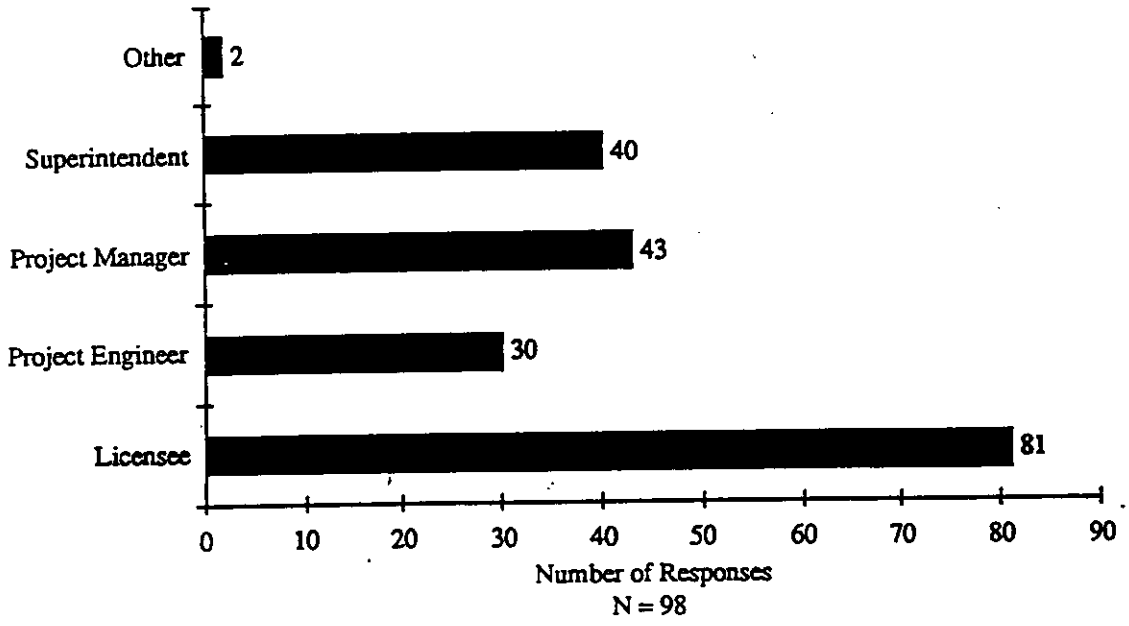

Figure 11. Analysis of Attitudes Toward Which Members Should Participate in Continuing Education.

Research Question 6

If continuing education is mandated for contractors, should it also be mandated for the other following professions?

___ Architecture
___ Engineering
___ Surveying
___ Building Officials
___ Other _____

If continuing education is to be mandated for licensed contractors, most believe it should also be mandated for building officials (82.7 %), architects (76.5 %), and engineers (71.4 %). Only 41.8 percent of the respondents support such a regulatory requirement for surveyors. Most contractors submitted approximately three responses to this question, therefore supporting collective agreement to the implementation of a mandatory CPE program throughout all design and construction professions. The absolute response frequency is presented in Figure12.

Research Question 7

Continuing education would best support the construction industry by performing or improving which of the following functions?

___ Update
___ Competence
___ Performance
___ Other _____

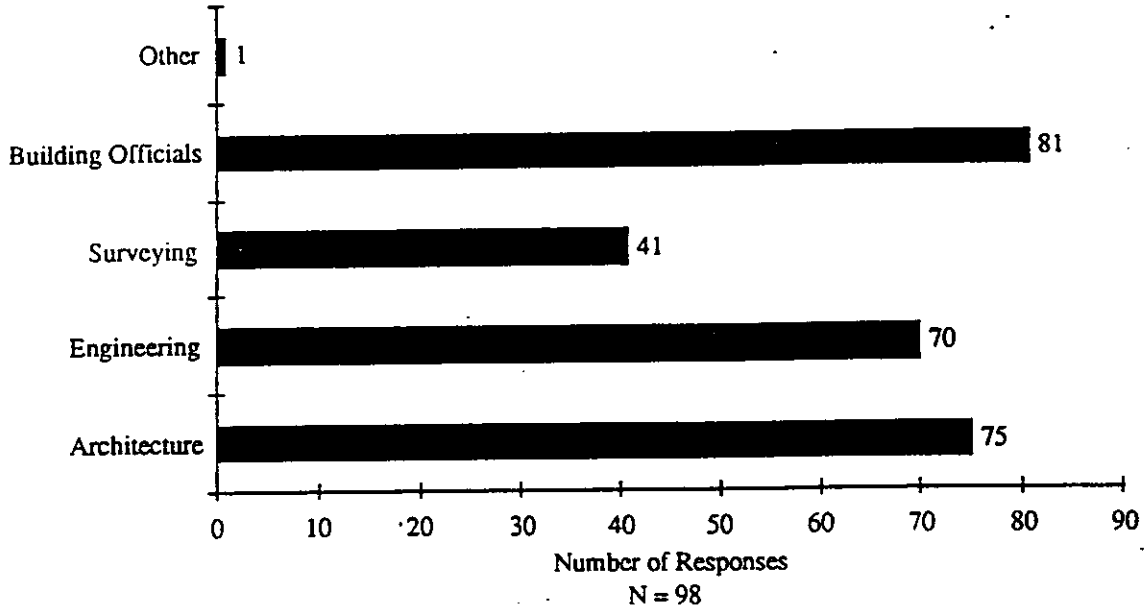

Figure 12. Analysis of Attitudes Toward Mandating Continuing Education in Other Fields.

Approximately one-half of the survey population submitted only one response for the function they thought how a continuing education program would best support professional development within the construction industry. One could infer that each licensee holds a singular attitude about how a continuing education program should be oriented, because responses were equally distributed with a clear order of precedence. Most indicated implementing a program would improve professional competence (64.3 %). Updating existing knowledge (45.9 %) with current practices and skills received the second most responses. followed by enhancing individual performance (37.8 %). The absolute frequency of responses are illustrated in Figure 13.

Research Question 8

What areas or topics should be addressed in continuing education?

___ Building Codes & Standards
___ Construction Contracts & Law
___ Project Management
___ Planning & Scheduling
___ Building Technology
___ Estimating
___ Project Safety
___ Ethics
___ Sales & Marketing
___ Computer Applications
___ Productivity Improvement
___ Building Failures: Lessons
___ Business & Finance
___ Development
___ Other _____

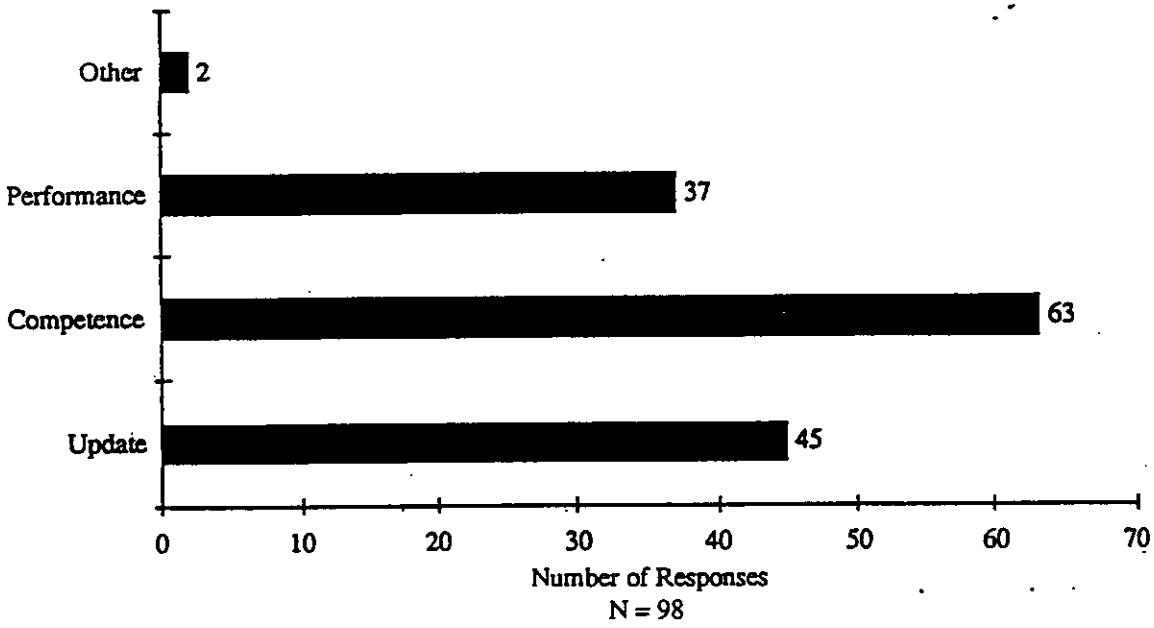

Figure 13. Analysis of Continuing Education's Primary Role.

Each licensee submitted roughly six responses in indicating what areas or topics should be addressed in continuing professional education. The relative frequency of responses ranged from 19.4 percent to 77.5 percent, indicating each subject's level of importance to professional practice as viewed by those responding to this survey. Table 25 represents the relative frequency of educational needs for all licensed construction fields

Table 25.
Educational Needs

subject	relative frequency
Building Codes & Standards	77.5 %
Construction Contracts & Law	62.2 %
Building Technology	53.1 %
Project Safety	53.1 %
Business & Finance	52.0 %
Building Failures: Lessons	52.0 %
Ethics	48.0 %
Computer Applications	41.8 %
Estimating	33.7 %
Planning & Scheduling	30.6 %
Project Management	29.6 %
Productivity Improvement	29.6 %
Development	19.4 %
Sales & Marketing	19.4 %

surveyed in this research study by order of desirability. Analysis was additionally performed determining desired course content for each respective licensed field. Figures for each licensed field are located in Appendix E indicating the absolute frequency of desired subject matter.

Research Question 9

In terms of long-range usefulness, which of the following continuing education/workshop sessions would be helpful to you?

___ Lecture/formal presentation
___ Group discussions with persons in similar professional settings
___ Group discussions with persons in different professional settings
___ Informal interaction with colleagues
___ Informal interaction with presenters/resource people
___ Demonstrations
___ Guided hands-on instruction
___ Correspondence
___ Other _____

Continuing education activity format has traditionally copied the lecture or formal presentation employed predominately throughout higher education. Responses received here presented no surprise to find that contractors prefer a lecture or formal presentation (55.1%), 80 percent more over any competing response. However, the analysis of attitudes toward preferred activity format demonstrated that activity formats other than the formal lecture would be acceptable. Interest was indicated for group discussions with persons in similar professional settings (30.6 %), guided hands-on instruction (27.6 %), correspondence (27.6 %), and demonstrations (26.5 %). Few contractors show much interest in any of the remaining responses as indicated in Figure 14. The analysis performed in question 9 is the first in which no clear rank order of attitudes was indicated. One could hypothesize that the most accepted presentation format would be the formal lecture, yet there is no single format dominating a second position.

Research Question 10

What continuing education activity duration would you be most able to attend?

___ Short course, 1-3 days
___ Evening course
___ Weekend course
___ Long course, greater than 3 days
___ Other _____

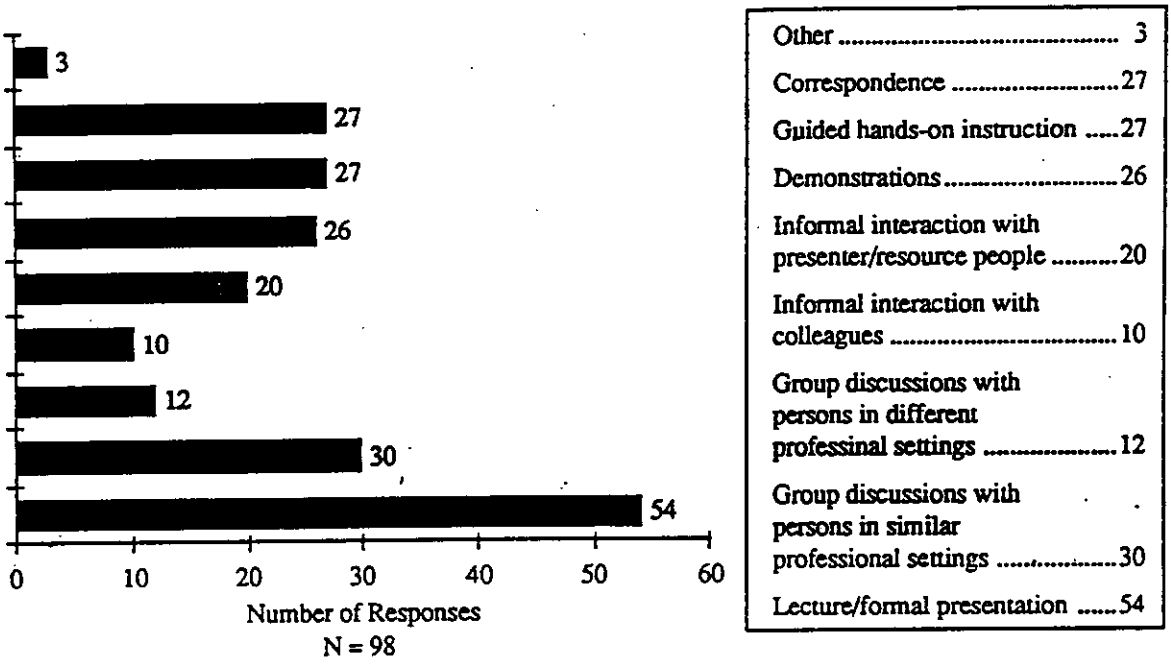

Figure 14. Analysis of Attitudes Towards Preferred Activity Format.

Contractors' attitudes toward activity duration are proportionally distributed indicating a clear ranking of preference. Most preferred is a short course duration of no more than 3 days (50.0 %) followed in rank by a weekend presentation (37.8 %). An evening structure is least preferred at 30.6 percent, and any course duration greater than 3 days is not considered feasible. This conclusion implies that any CPE activity greater than 3 days in duration should be packaged into marketable parcels whereby each unit could emphasize a particular skill. Question 10 did accumulate a greater portion of "other" responses which emphasized a correspondence approach. The absolute frequency of responses is predicted in Figure 15.

Research Question 11

How many continuing education activities should one attend per two year period?_____

Contractors generally believe they should be participating in more continuing education activities than they presently are, particularly if an MCE program is implemented. An average of 1.8 courses is suggested per biannual period, not significantly higher than a current participation rate of 1.4 for the same period. The most striking conclusion to be drawn from this analysis is shown in Figure 16 where all respondents, with only a single exception, recommended a minimum of one activity.

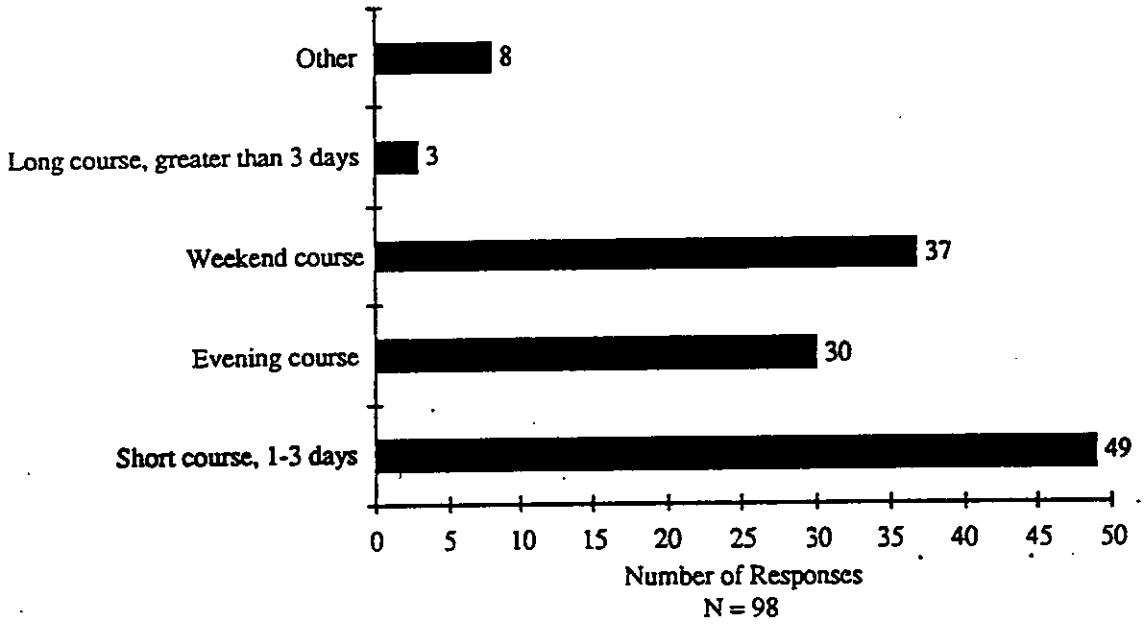

Figure 15. Analysis of Attitudes Towards Preferred Activity Duration.

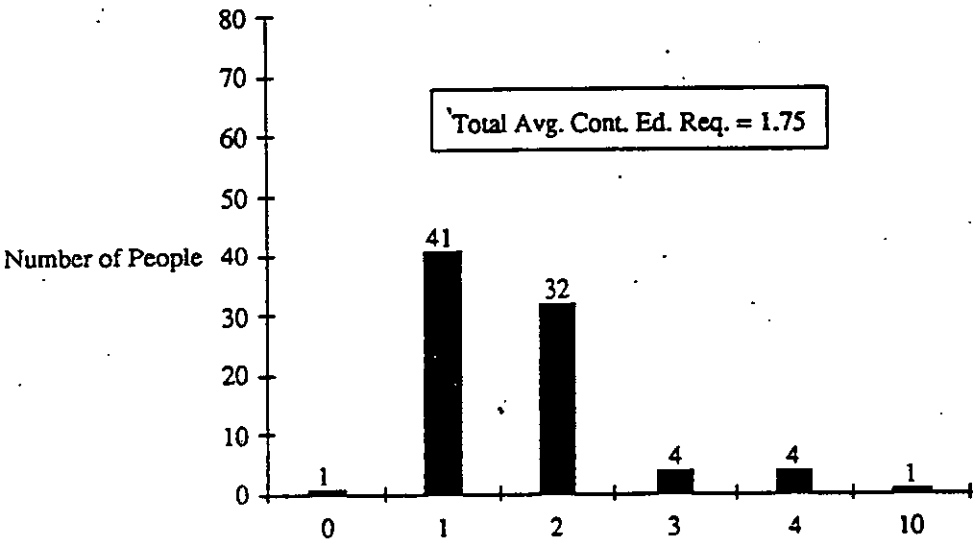

Figure 16. Frequency Distribution of the Number of Suggested Continuing Education Courses Per Two-Year Period.

Research Question 12

Where would you prefer to attend a continuing education activity?

___ Local
___ Region within Florida (100 mi)
___ Anywhere within Florida
___ Southeast United States
___ Anywhere in United States
___ Other _____

Figure 17 indicates clearly how far contractors are willing to travel to attend a continuing education activity. Only 2 percent of the survey population would attend a course located anywhere in the Southeast with no one desiring to venture further. Question 12 is of an open-ended format and would have allowed more than one response if believed by the respondent, yet this research question solicited the smallest average response rate of the survey. Approximately two-thirds (64.3 %) of the construction workforce believe courses should be available in their respective local area. Thirty-two percent of the population are willing to travel a maximum of 100 miles; as such, this analysis concludes that no practitioner should be required to travel any further to attend educational activities.

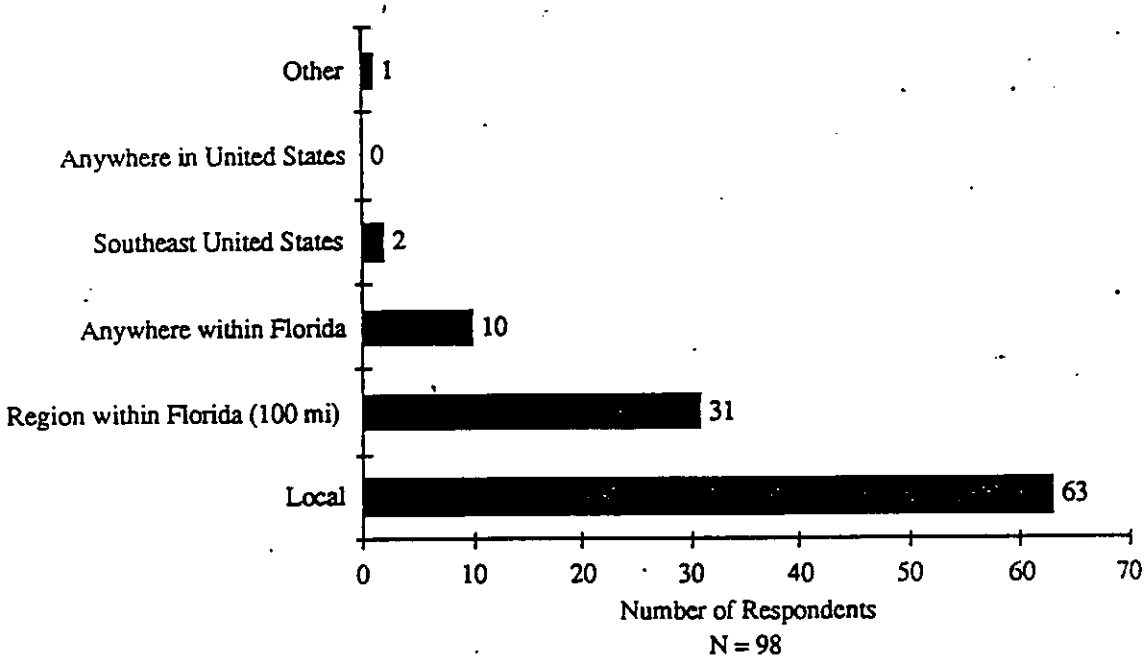

Figure 17. Analysis of Attitudes Towards Preferred Activity Location.

Research Question 13

What would be a reasonable fee per continuing education activity?

___ Under 100 dollars
___ Between 100 and 200 dollars
___ Over 200 dollars
___ Other _____

Seven licensees of the sample population chose not to respond to this research question. Few, only 3 percent, believe a continuing education course should be priced over 200 dollars, while another 3 percent stated educational activities should be provided free as part of their licensing fee. Most contractors (55.1 %)

prefer an activity cost under 100 dollars. The remaining (31.6%) are willing to pay over 100 dollars but no more than 200 dollars to participate in an educational activity. Figure 18 presents the absolute frequency of responses toward preferred activity cost.

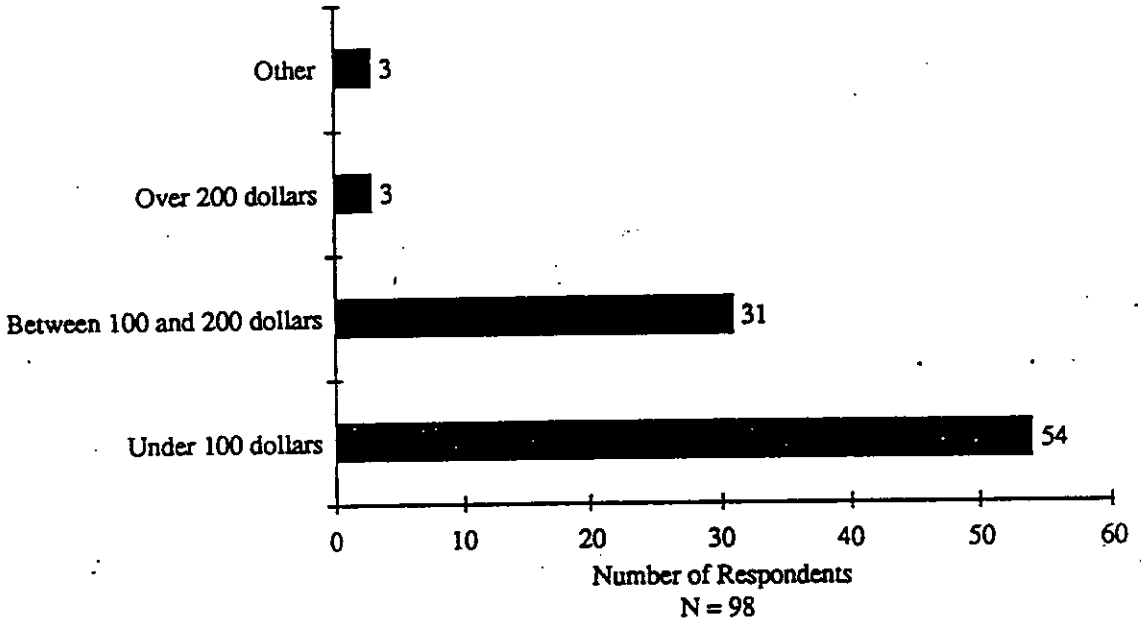

Figure 18. Analysis of Attitudes Towards Preferred Activity Cost.

Summary

Precise methods addressing validity and confidence of the sample size were not employed; nor were attempts made to distort the data, therefore misrepresenting the analysis to better conform to the study's desired outcomes and benefits. As previously stated, this study's effective response rate of 22 percent resulted in a sample population of 158 licensed contractors. The analysis performed herein represented the attitudes of one-half a percent of all state-licensed contractors in Florida. Because proven sampling methods were employed to stratify and systematically select the sample population, the results appear to be valid in that significant trends were observed for each research question. Now is the time to confront such attitudinal issues. Doing so could situate the construction practices at the top of the performance iceberg. Of course, everyone can chose not to make waves and continue tolerating current market inadequacies.

CHAPTER 6
CONCLUSION

Comprehensive Assessment

Everyday activity has been maintained and enhanced for countless decades by an impressive array of construction, awesome in both diversity of form and function. Buildings, homes, tunnels, highways, pipelines, dams, docks, canals, bridges, airfields, and a myriad of other structures have been and will continue to be created to provide us with the goods and services we require. To some degree, each construction project is unique, tailored to suit its environment, arranged to perform its own particular function, and designed to reflect individual tastes and preferences. Our expanding needs and desires are not foreseen to diminish, consequently we must be increasingly concerned for the welfare and safety of our society. Although 24 states have implemented statewide licensing programs since 1925 in their attempts to ensure practitioner competence, the public interest is best served by requiring only competencies for skills critical to public health and safety. Remaining non-critical competencies should emanate from the supply and demand for services of the practitioner in the competitive market within one's respective profession.

Economically, construction has been the largest single production industry within America for the past several years. As of April 1988, the construction industry directly employed 5,262,000 individuals (AGC, 1988). It is not surprising that the construction industry does and will continue to have a great influence on the state of this nation's economic health. Specifically, within the state of Florida, the construction industry directly accounts for 7.9 percent of the total earnings on a place of work basis (U. S. Department of Commerce, 1985). Competition, although not expected to dramatically rise, will improve and will eventually change the nature of being a small business practitioner. Distinctions among competing construction establishments will disappear as practitioners attempt to survive with less or no room to maneuver. The construction practitioner cannot afford to continue his boycott of available assistance.

Despite prior attempts to ensure practitioner's competence and their seemingly beneficial economic contributions, on the whole construction practitioners have been slow in applying proven management methods. Business is not going to remain as usual. The United States construction industry suffers technological and economic stagnation wherein many characterize management as being weak, inefficient, nebulous, backward, and slow to react to changing conditions. This study has demonstrated the necessity to reestablish a minimum program of professional continuing education and/or training that would be equally assessable for all practitioners. Presently, professional education providers attempt to provide a wholesale provision, somewhat analogous to a pre-entry orientation, to segmented fields in which many contractors because of the changing technology and economy have found an increased necessity to cross over the borders of their peers to deal with other fields. Our previous assurance that continuing professional education has always been assessible and considerate of practitioner's needs is absurd. By multiplying the probabilities of finding an education activity within 100 miles (15 %) and of enrolling in that activity for less than the estimated low-end deviation cost of 263 dollars (16 %), the likelihood of a licensed construction practitioner attending such an activity is only 2.4 percent, neglecting consideration of other factors. The construction practices cannot sufficiently prepare for changing environments as CPE is currently structured and oriented. Both the weaknesses and deficiencies of our current continuing education system must be addressed, further researched, and overcome prior to expecting any recognizable gains in practitioner competence and performance if CPE is to be tendered as a quality or demand intervention strategy.

Professional and trade groups have played many roles in bringing much of the existing legislation into being. More often than not, they have been the original instigators of attempts to increase regulation and, surprisingly, of attempts to resist change of regulation within their profession. These associations would indisputably benefit financially by either the implementation of a mandatory continuing professional education program, or of the promotion or subsidizing of educational activities by the state. Nevertheless, the results of this study, if effectively implemented, may generate short-term animosity between governmental regulatory agencies and professional associations because of differing interests. Professional and trade groups have found many reasons to operate in the update model rather than the competence model, which inevitably would involve the interprofessional context of work. For any regulatory strategy to stress zero defects or no failures, improved

competence and performance must be aggressively sought. Even AGC's noted Supervisory Training Program, which the chairman, Construction Education Committee, AGC (1988, p. 37), states "has no equal in the industry," is enslaved to many misfortunes by dodging operations in a true competence-based model. Nowlen (1988) surmised the ultimate aspiration should be to account for the social dimensions of individual performance, to address the interprofessional when it is a catalyst of ensemble performance and to demonstrate that persons with superb professional proficiency will still malfunction seriously without a similar degree of attention to their human development. Variations and distinctions in individual professional competence must be addressed for CPE to be of real service to society. Why is there so little outcry on this issue? Without the alteration of continuing professional education strategies to produce meaningful greater benefits to the practitioner, CPE will remain seen as bureaucratic, inhibiting, and as an unproductive use of limited resources.

Practitioners want action, that's the bottom line. Results get rewarded, not the process. Yet, in the process we must learn to obviate all failure. If we are to compromise a little, then why not compromise more. The pursuit of excellence and perfection should propel all professions. Otherwise, what benefit is there in being a professional if these are not one's aspirations. This chapter presents the reader with the significant findings and outcomes of the study, succeeded by the revision of Nowlen's competence-based CPE model for the design of a sample activity, along with recommendations, and suggestions for further research. The findings and outcomes of the study follow concluding reflections established in the literature review.

Significant Findings and Outcomes

The integration of this study's results with research of others has denoted further findings and outcomes requiring supplementary discussion. This section is devoted to the discussion of these influences which can better alter CPE administrator's understanding and practicing of attendance in education activities.

Current Attitudes Towards Continuing Professional Education

Practitioners are clearly in a better position than either educators or administrators of a profession to spotlight current attitudes within their respective marketplace. This study confirms the findings of prior research by noting a contrast of attitudes among professions based upon the characteristic of occupation.

Moser's analysis (ref. Tab. 10, p. 40) was not specific to those attitudes of professioals in Florida, yet a trend is established by comparing his findings to those continuing education requirements for parallel occupations in Florida cited in Table 20 (ref. p. 75). Mandatory continuing education is generally accepted by those regulated professions which currently maintain formal, entry-level educational standards and require continuing professional education as a provision for relicensure. Research Question 1's results are consolidated in Table 26 with the attitudes one may envision for other regulated occupations in Florida. This presentation raises the question that for contractors to accept mandatory continuing education, formal entry education standards must first be introduced.

While prior studies have demonstrated that professionals voluntarily participate in CPE programs, contractors have abstained from participating in most educational activities. Analysis of the responses to Research Question 3 disclosed that contractors frequent less than three activities in a four year period. If CPE program administrators understood those determinants that produce positive attitudes toward mandatory continuing education, they could better assist in the planning, design, and implementation of professional education activities. Through the cumulation of findings from numerous studies, several factors become evident which likely account for the disparity in attitudes among the construction practices and other regulated occupations.

First, no state requires a contractor to graduate from an accredited institution to obtain their license (ref. Tab. 19, p. 73). Minnock's (1986) study disclosed in Table 11 (ref. p. 40) that non-college graduates strongly oppose mandating continuing professional education. Second, males historically have been the dominate gender comprising the construction workforce and they are also the gender less likely to favor MCE. Third, Moser (1986) researched attitudes versus age (ref. Tab. 9, p. 39) and established a linear relationship between age and resistance. The older the practitioner, the more one is inclined to oppose any change in the status quo. Demographic data of the respondents revealed a mean of 12.9 years as the period survey respondents held their license. A summary of these factors is recapitulated in Table 27. The licensed contractors surveyed were predominately male, non-college graduates with a mean of thirteen years experience. The findings of this study therefore concur with and reinforce attitudinal research performed by others in the education field.

Table 26.
Analysis of Expected Attitudes Toward Mandatory Continuing Education and Profession in Florida[1,2]

profession	favoring N	%	opposed N	%	neutral N	%	total N	%
Pharmacists	480	80.9%	113	19.1%	0	0.0%	593	100%
Dentists	1,406	65.5%	740	34.5%	0	0.0%	2,146	100%
Nurses	2,199	61.7%	704	19.8%	660	18.5%	3,563	100%
Phys. Ther.	846	58.0%	609	41.7%	4	.3%	1,459	100%
Psychologists	74	56.5%	57	43.5%	0	0.0%	131	100%
C.P.A.'s	252	48.6%	204	39.3%	63	12.1%	519	100%
Physicians	428	45.0%	524	55.0%	0	0.0%	952	100%
Lawyers	92	44.0%	117	56.0%	0	0.0%	209	100%
Contractors (Avg)	39	24.7%	119	75.3%	0	0.0%	158	100%
Pool	3	75.0%	1	25.0%	0	0.0%	4	100%
Electrical	2	50.0%	2	50.0%	0	0.0%	4	100%
A/C	4	44.4%	5	55.6%	0	0.0%	9	100%
Mechanical	1	33.3%	2	66.7%	0	0.0%	3	100%
General	14	21.2%	52	78.8%	0	0.0%	66	100%
Building	6	20.7%	23	79.3%	0	0.0%	29	100%
Residential	4	17.4%	19	82.6%	0	0.0%	23	100%
Roofing	0	0.0%	1	100.0%	0	0.0%	1	100%
Sheet Metal	0	0.0%	1	100.0%	0	0.0%	1	100%
total	5,816		3,205		727		9,730	

1. Percentages are in relationship to the number of individuals in each profession
2. Incorporates analysis by Moser, 1986, p. 67 (ref. Tab. 10, p. 40)

Table 27.
Comparison of Characteristics Favoring
Mandatory Continuing Education[1]

characteristic		absolute frequency	relative frequency
Non-College Graduates		25	36.5%
College Graduates		43	63.5%
Gender:	Female	43	63.2%
	Male	25	36.8%
Age:	20-39	97	46.6%
	40-49	66	38.6%
	50-59	10	15.9%
Contractors		39	24.7%

1. Summarizes analysis by Minnock, 1986, p. 52., and Moser, 1986, p. 73

Implications for Addressing Small Construction Establishments

Construction establishments in Florida currently employ small staffs of under ten people. While most licensed contractors regard themselves as specialists, they endure primarily as small business people. Vast amounts of information have been compiled describing why small businesses fail, some of which were previously outlined in the Application of the Study for the construction industry. Investigation is continually conducted into the characteristics of the small business person and a brief discussion is therefore dictated for comprehending those characteristics significant to the formation of the small business person's attitudes.

Small business persons typically regard themselves as inordinately hard-working. "In the eyes of his associates, he is perceived as a man who never rests, content with past successes, but must ever strive anew for additional triumphs" (Sotrines, 1984, p. 22). The dominant trait which distinguishes the small business person from the business executive lies in their attitudes toward authority figures and interpersonal relations. They seem to have a articulated vision of their environment and how they want to be in it. The successful business

executive has a positive attitude toward authority and a structured environment unlike the small business person who does not (Collins and Moore, 1964). Solicited anonymous comments and suggestions from licensed contractors (ref. App. G, p. 156) overwhelmingly support the position that contractors are no better than entrepreneurs, in that they are unwilling to submit to authority, unable to work with it, and consequently need to escape it. Continuing education cannot be effective within such an industry without placing emphasis on habits, attitudes, and customs of the small business person for them to recognize their fears, resistance to change, and lack of knowledge.

Implications for Activity Orientation

By understanding the psychology of the small business person, one may discern the contractor's reluctance to utilize available educational assistance. The failure to satisfy business needs through educational programs is because the programs do not view the small business practitioner from the standpoint of habits, attitudes, and customs. There is an obvious need for education administrators to focus on personality characteristics and attitudes as determinants in the design of learning activities.

Many studies present MCE to be the most accepted means of monitoring professional competence, despite increasing recognition of its limitations (e.g., Moser, 1986; Smith, 1981; Cooper, 1980). The most serious flaw of research to date is its implicit assumption that performance is entirely an individual affair. Exclusive focus on the individual has eluded considering the quality of the relationship individuals have within the organizational setting; (i.e., the ensemble of peers, subordinates, superiors, and systems). Nowlen (1988) recently introduced the belief that performance is as much a function of the ensemble as it is of the individual. Current education activities have yet to reflect this departure from previously established doctrine.

Research Question 4 inquired into reasons which were, or would be, important in deciding to participate in an educational activity. Respondents stated that the desire to increase their proficiency (ref. Fig. 10, p. 87) was the foremost motivation for their participation in PCE. Practitioner proficiency cannot be effectively elevated by operating in an update model, yet professional associations have not taken heed of current educational trends by expanding their educational models to include individual competence or ensemble performance. To instigate support for this change, Research Question 7 was posed to determine continuing

education's most supportive role in practitioner development. By close to a two-to-one margin, respondents believed PCE should be oriented to improving practitioner competence. Appendix I (ref., p. 164) details the analysis of this question according to each construction field.

This study has noted a conflict in attitudes between the survey respondents' preferred activity presentation and preferred activity orientation. While contractors embrace the advancement of the competence model, they choose to preserve the traditional lecture/formal presentation method by eighty percent over any possible format. Dean Griffith, past chairman of the Continuing Professional Development Division, American Society for Engineering Education comments on his experience with presentation methods:

> But, too often, the traditional lecture method is used. The number of specific skills that a professional can learn or the amount of knowledge he or she can absorb, to the extent of improving performance, is minor in large lecture classes (forty-plus students) taught by the traditional approach. In these cases, professionals often try to salvage as much benefit from their attendance as is possible by meeting needs other than competency requirements. (1983, p. 70)

Research Question 9 which addressed attitudes towards preferred activity format, concluded there is no second most-preferred presentation format. Interest was indicated for group discussions with persons in similar professional settings (30.6 %), guided hands-on instruction (27.6 %), correspondence (27.6 %), and demonstrations (26.5%). Research has demonstrated effective operation in the competence model requires the employment of a combination of non-traditional presentation procedures and techniques. "Training involves neither generic learning nor speculative learning. Training is job- and task-oriented, with strong emphasis on 'how-to' procedures and techniques" (Griffith, 1983, p. 71). Contractors show little interest in any of the remaining potential presentation techniques as previously indicated in Figure 8 (ref. p. 85).

Implications for Curriculum Content

This study investigated curriculum content needs to be addressed in activity design. The findings included within Table 25 (ref. p. 90) should be assimilated into a job function analysis program to provide a foundation for determining linkages, developing educational syllabuses, and evaluating the competency of participants upon the activity's completion. Analysis was further performed to determine specific needs within respective licensed fields (ref. App. E, p. 146). The topics investigated solely constitute baseline knowledge

and skills within the performance ensemble previously discussed. Other variables demonstrated a strong influence on performance: (1) the challenge of new roles; (2) requisite skills in human relations; (3) critical skills of mind; (4)proficiency in self-managed learning; (5) individual developmental progress, organizational developmental balance, and the fit of individual and organization to one another; (6) skills in coping with life's surprises as well as its anticipatable transitions; and, (7) understanding of the influences of environments and cultures and the skills to orchestrate them. The development of baseline knowledge and skills must parallel the maturing of these other variables.

A single determinant exists that may have eluded critical debate in molding a comprehensive long-term strategy for continuing professional education — participation, that is, the amount or quantity of contact hours to be accumulated. Table 20 (ref. p.75) detailed MCE requirements for thirteen regulated occupations in Florida. Of those occupations requiring MCE as a condition for relicensure, only a meager average of 34.3 total hours is required per two year period. This study has incessantly stressed the time-extensive characteristic of competency-based CPE. To support this issue, a sample activity was assembled to illustrate how time consuming a single CPE activity may become. The Sample activity (ref. App. O, p. 191) alone is 45 contact hours or 60 total hours in duration. If the sample or a similar competency-based CPE activity was to become mandated following criteria implemented for other regulated occupations in Florida, the practitioner would, by law, be required to complete only one-half the sample activity within a two year period. The state would be absurd to mandate less than one activity in the pursuit to ensure practitioner competence. Survey respondents cited desirable participation rates under two activities per biannual period. This position may be just as untenable.

Researching practitioner educational needs resulted in seven subjects with a relative response frequency at or above 50 percent (ref. Tab. 25, p. 90). How can competencies in less than seven pertinent subjects be maintained and updated through prescribing mandatory attendance in a single educational activity? Prescribing a single CPE activity may make the practitioner aware to many voluntary participation opportunities, yet is such high-inference logic in the public's interest? This study contends that construction practitioners may have to be compeled through legislation to participate in CPE activities at a much higher rate than they

presently desire. The question then becomes how many CPE activities are requisite for competent practice - 2, 3, 4, . . . 10? Is this no different than requiring contractors to achieve a formal four-year college degree. This can only be determined through further social-benefit analysis.

Implications for Cost Benefit Determinants

This study addresses several financial considerations for effective implementation of a continuing professional education program. An analysis of current educational offerings is provided herein. The financial feasibility of offering the proposed competence-oriented educational model is provided under separate section. Discussion is herein limited to analyzing information requested from forty-seven professional associations surveyed which has been integrated with that obtained from personal interviews with existing continuing education providers.

Statistical translation of over 200 construction-business related courses resulted in a mean activity price of 478 dollars. An extreme standard deviation of 215 dollars was recognized; therefore, two-thirds of all continuing education participants will spend between 263 dollars and 693 dollars, exclusively on the curriculum activity. A detail which is often ignored, yet extremely suggestive, is the sacrifice of more than 82 dollars[2] in personal income per business day foregone and 128 dollars[3] in earnings sacrificed for the establishment. This can quickly total to an expected gauge of 898 dollars to participate in a two-day educational activity, while disregarding other notable expenses such as transportation, lodging, and meals as previously discussed in Chapter 2. One can conservatively speculate that for each activity/participant per year, an establishment's annual economic performance (gross sales) must increase 1/4 a percentage point to recapture its educational investment. Can such an investment be considered an investment in public safety? To date, no research has attempted to validate this postulate in any profession. This researcher would be very interested in the outcome of such a study.

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2. (FL earnings place of work) (distribution) (8 hrs./day) (avg. no. reporting units) (avg. no employees) (2000 hrs/yr) (86,405,000,000 dollars/yr) (7.9% construction) (8 hrs/day) (34,533 units) (9.7 employee/unit) (2000 hrs/yr) 82 dollars/employee-day (1985 dollars)

3. (FL value construction contracts) (8 hrs/day) (avg. no. reporting units) (avg. no. employees) (2000 hrs/yr) (17,605,000,000 dollars/yr) (8 hrs/day) (34,533 units) (9.7 employee/unit) (2000 hrs/yr) 210 dollars/employee-day (1985 dollars) 210 - 82 = 128 dollars/employee-day

Implications for Activity Location

Each responding professional association was requested to submit the location(s) where their respective educational activities were to be offered during the 1988 calender year. Of those indicating the location of their offerings, only 27 percent of all activities were to be offered within the state of Florida. Only 10 percent of the survey population indicated they would be willing to travel further than 100 miles to attend the activity. Based upon the results of this study, a contractor may realistically only be able to select an educational activity from less than 15 percent of current offerings. Continuing professional education is not as accessible as we have assumed.

For a CPE program to benefit all parties concerned, crucial administrative restructuring is necessary for educational activities to be more accessible. Removing classes from the hotel conference room and from existing association facilities is a significant step towards better achieving an efficient allocation of resources. Professionals should not finance economic investments of other entrepreneurs attempting to "make a buck" in the continuing education provider market. Numerous public facilities presently suitable for such use abound. Table 28 shows the current location and enrollment of public higher education colleges and universities in Florida. Each institution presently maintains a continuing education staff which could assist in the implementation of an education program for licensed contractors. Facilities exist which require no modifications in at least 32 Florida counties. Numerous secondary educational facilities also exist within which activities could be accommodated.

Implications for Activity Evaluation

Bleuer (1986) believed that problems related to the utilization of CPE workshop evaluations emanate not from the lack of use of evaluation results, but from the misuse of evaluation results. Few education providers grasp the impact evaluation has on the future of a curriculum. In their misuse, evaluation results seldom move beyond questions of teaching and learning to the issue of impact. For example, this situation presently exists at the University of Florida.

The University of Florida Division of Continuing Education's conference evaluation form (ref. App. M, p. 184) is typical of those predominately employed within the continuing education market. This

Table 28.
Higher Education: Location and Enrollment of Colleges and Universities in Florida, Fall 1982

School[1]	City	County	Enrollment[2]
Brevard Community College	Cocoa	Brevard	10,689
Broward Community College	Ft. Lauderdale	Broward	22,515
Central Florida Community College	Ocala	Marion	3,030
Chipola Junior College	Marianna	Jackson	1,238
Daytona Beach Community College	Daytona Beach	Volusia	7,793
Edison Community College	Ft. Myers	Lee	5,647
Florida Junior College at Jacksonville	Jacksonville	Duval	15,661
Florida Keys Community College	Key West	Monroe	1,585
Gulf Coast Community College	Panama City	Bay	3,913
Hillsborough Community College	Tampa	Hillsborough	11,812
Indian River Community College	Ft. Pierce	St. Lucie	5,894
Lake City Community College	Lake City	Columbia	2,874
Lake-Sumter Community College	Leesburg	Lake	2,076
Manatee Junior College	Bradenton	Manatee	6,604
Miami-Dade Community College	Miami	Dade	37,246
North Florida Junior College	Madison	Madison	821
Okaloosa-Walton Junior College	Niceville	Okaloosa	3,638
Palm Beach Junior College	Lake Worth	Palm Beach	11,954
Pasco-Hernando Community College	Dade City	Pasco	3,018
Pensacola Junior College	Pensacola	Escambia	8,659
Polk Community College	Winter Haven	Polk	5,256
St. Johns River Community College	Palatka	Putnam	1,654
Santa Fe Community College	Gainesville	Alachua	7,354
Seminole Community College	Sanford	Seminole	5,172
South Florida Junior College	Avon Park	Highlands	992
Florida Agricultural and Mechanical University	Tallahassee	Leon	4,825
Florida Atlantic University	Boca Raton	Palm Beach	9,089
Florida International University	Miami	Dade	13,620
Florida State University	Tallahassee	Leon	22,022
University of Central Florida	Orlando	Orange	14,180
University of Florida	Gainesville	Alachua	34,252
University of North Florida	Jacksonville	Duval	5,444
University of South Florida	Tampa	Hillsborough	25,743
University of West Florida	Pensacola	Escambia	5,294
Tallahassee Community College	Tallahassee	Leon	4,871

1. Includes public institutions that are legally authorized to offer and are offering at least a one-year program of college-level studies leading to a degree.
2. Includes undergraduate, graduate, first-professional, and unclassified students, both full- and part-time.

Source: Podolsky and Smith, 1984

questionnaire solicits opinions about an educational program's worth and is distributed at the program's conclusion. Referring to this form, it would be very difficult to assess and verify the influence to a practitioner's performance. No linkages between participants' responses to traditional evaluation items and the application of skills can be documented. This study contends the use of such an oversimplified evaluation form should be averted. Major surgery considering relevant items previously discussed in Chapter 2, Evaluation of Continuing Professional Education Courses, is required for faith to be restored in program evaluation.

Implications for the Administration, Development, and Marketing of CPE Activities

Success in CPE programs for professional advancement must be the result of studied design. This study emphasized the significance of planning in CPE programs and has satisfied its objective of introducing and evaluating the feasibility of continuing professional education for the licensed contractor. Successful program administration is the business of everyone who has a stake in its outcome. However, while everyone must strive towards the advancement of the program, many development functions are better left to those professionals whose expertise is in the design, development and marketing of continuing education activities. The University of Florida Division of Continuing Education (DOCE) utilizes a realistic tactic for developing educational activities (ref. App. N, p. 186). DOCE will provide professional services to any college or association to include assistance with program planning, promotion, implementation and/or fiscal management for a percentage of the expected financial returns. Few continuing education centers have yet to structure their services to establish a working alliance with the professions as exemplified herein. If the state should become further committed to professional development, this study contends that administrative functions should be centrally overseen.

Revised Competence Model

It remains absurd for professional education providers to prepare the practitioner for understanding any potential problem faced in changing environments. The underlying aim is typically to cover the widest range of possible general fundamentals potentially applicable to the widest set of problems. This study advocates the creation and training of linkages among skills to be the primary aim of professional continuing education. Training, in this context, has the goal of developing task-specific competencies for immediate professional

practice, as compared to abstract learning of general continuing education as currently structured. The practitioner's procurement of such linkages is critical to continue operating with the knowledge and skills essential to render the best service possible.

A strategy, as illustrated in Figure 19, is proposed to establish linkages among relevant influences on competence. The four poles, (initial education, in-service training, industry and research), are superimposed over updates in Nowlen's (1988) model. This addition is made to account for standards representative of the ever-changing current practice, not ideal standards created solely by the academic community.

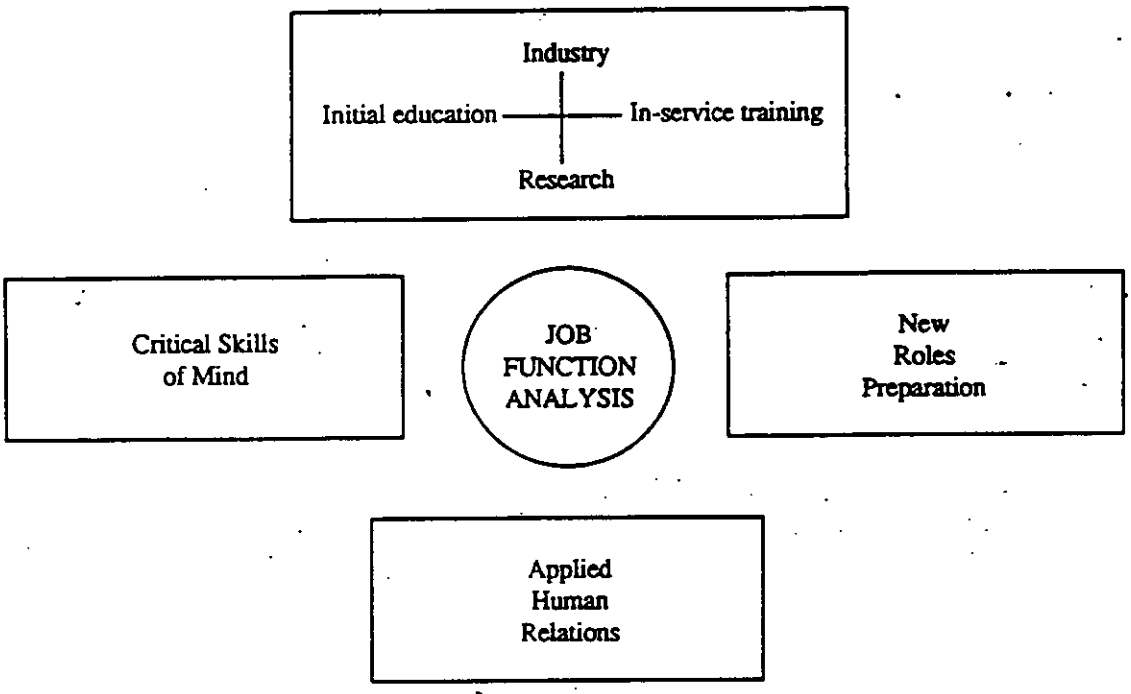


Figure 19. Revised Competence Model[1]

1. Incorporates findings by Nowlen, 1988, p. 32

Nowlen previously defined competence as marked or sufficient aptitude, skill, strength, judgment, or knowledge without noticeable weakness or demerit. Definitions refer to both the presence of characteristics or the absence of disabilities that render a person fit, or qualified, to perform a specific task or to assume a defined role. For a CPE program to ensure life-long transference of knowledge into skills, those relevant issues depicted

in Figure 19 must be incorporated into the program's design. This provides the practitioner with the tools to adapt to changing market environments.

In selecting an approach to facilitate knowledge utilization, activity developers need to first determine the extent to which the content of the activity addresses an innovation from the perspective of the participants, as opposed to theory, which advocates a refresher or update on existing and accepted knowledge and/or skills. If the content represents an innovation for the participants, activity designers should try to determine where participants are in terms of their employment of the innovation (Bleuer, 1986). This depends on the nature of the topic, the participants' level of knowledge coming into the workshop, and the extent to which the topic has been accepted by the profession and the people they serve. "An accurate reading of these factors may help workshop planners determine whether the participants should be treated as potential adopters of an innovation or as change agents who need help infusing the innovation into their own settings" (Bleuer, 1986, p. 152). Pretest questionnaires or surveys can assist in the determination of participants' status. Another potential aid is the review of activity curriculum by practitioners to assess its strategy to facilitate knowledge transfer into competencies. Program planners and instructors should perhaps devote less attention to the topic itself and more attention to the transfer of the topic to the participants' settings. Curricula for professional continuing education should be assembled by both the professional body and by the staff of the educational institution who are teaching the activity, where each would be debate for minimum competencies and an accepted means of transfer.

Activity developers must shift continuing education's fundamental orientation from the practitioner as a passive consumer to the practitioner as an active source of knowledge about the critical elements of professional performance. The profession's intellectual record and the literature of its practice yield major frames of practical reference which act like sensitive scanning devices. Scanning the various settings of practice is a diagnostic process designed to identify the widest possible range of continuing education interventions (Nowlen, 1988). The extremes of potential intervention include (1) sticking to the basics by providing programs that increase proficiencies in knowledge and skills, and (2) placing emphasis on the habits, attitudes and customs of practitioners to get them to recognize their fears, resistance to change, and lack of knowledge (Sotirnes, 1984). This study has determined the need for educational intervention to encompass both philosophies. If

practitioners recognize their fears, resistance to change, and lack of knowledge, the means to conquer these deficiencies must also exist.

At the present, it does not appear feasible to implement a performance-oriented continuing education model. Any attempt may prove too exhausting for the construction industry to grasp; therefore, the change from the update model to the competence model and ultimately to the performance model must be a slow process. The concept of competence has to receive more careful attention if the relationship between competence and performance is to be better understood. Contractors are willing to accept competency-based education and training. However, program developers need to be aware that the most serious flaw in the competence approach is its implicit assumption that performance is entirely an individual affair that leads the model to a restricted focus on the individual.

Sample CPE Activity

A sample CPE activity (ref. App. O, p. 191) has been designed to illustrate the competence-based strategy and is condensed below to provide an overview.

Determining Risk and Bid Desirability
in Construction Contracts and Specifications

Program Outline

Session 1 - Methods of Contracting

Session 2 - Introduction to Contract and Construction Law

Session 3 - Internal Structure of the Construction Contract

Session 4 - Elements of the Project Manual

Session 5 - Contract Clauses and Standard Contract Documents

Session 6 - Methods of Specifying

Session 7 - Constructibility Reviews

Session 8 - Contract Documents and Specifications in Perspective

This activity somewhat emulates the content of other seminars sponsored by national professional associations to include

The Construction Specifications Institute (CSF) -
Specifications and Construction Contracts

The National Association of Home Builders (NAHB) -
The Graduate Builders Institute: Construction Contracts and Law

The Associated General Contractors of America (AGC) -
Supervisory Training Program: Using Contract Documents & Construction Law

The Construction Financial Management Association (CFMA) -
Understanding Construction Contracts

Although the curriculum content may appear similar, the proposed activity's goal is to develop task-specific competencies and linkages for immediate professional application as compared to abstract learning of general knowledge as found in the previously cited seminars. One can compare this study's proposed CPE activity (ref. App. O, p. 191) with that of the Construction Specifications Institute (ref. App. P, p. 219).

The linkage concept applies to the need for association between trainer and trainee. This sample activity has been designed where trainers are well-linked to each other so that they can coordinate and complement others' skills. Each trainer therefore must portray a variant perspective or point of view for the participant to comprehend real-world performance linkages. The CPE trainers should be assembled from each of the following fields: (1) architecture - specification and contract preparation; (2) construction - business development and bid evaluation; (3) law - construction and contract litigation; (4) public building official - plans and specifications examiner; and, (5) education - professor of construction. Rarely are all members of the performance ensemble involved in training situations. Boycotting the interprofessional context of communication in education and training programs at this desperate moment will compel an already failure-prone industry to increasingly further economic and technological stagnation.

Additionally, such experiences should be able to capture and hold the attention of the program's participants. The inclusion of all members of the performance ensemble is only an initial maneuver. Attention can best be maintained by recruiting trainers from the same region wherein the participants have established their practice. Many professional associations employ CPE trainers who commute a national education provider circuit, frequently speaking more on abstract learning of general knowledge than on specific skills the practitioner can implement in his home environment. The most respected or renowned practitioner is too often far removed from daily practice, just as can be the formal higher education professor. They should and

essentially must be a territorial practitioner who is familiar with, and who operates in, the local market. Whenever a trainee can relate educational activities to experiences commonplace to his local market, and hence the practitioner's existing foundation of knowledge or skills, the activity has then provided a greater benefit than just the transfer of knowledge into skills. It will have imparted upon the participant immediacy of application through experiential involvement and realism. Jung (1970) cites these factors as being consistently important to satisfying a program's objectives:

> The more similar the conditions of the training setting to the back-home setting, the more likely will be the application of new skills and orientations back home. This is a major rationale for the use of simulation techniques in training. (p. 22)

This sample CPE activity was conceived to develop skills in evaluating overall business risk in construction contracts and specifications. As such, real project documents, familiar to trainees, which have been extracted from respective local markets should be employed in assisting the requisite transfer. For this sample activity, a selected size of ten case studies was deemed necessary to ensure adequate exposure to the numerous daily situations the practitioner will confront.

The remainder of the sample program characteristics should reflect the findings obtained from the survey of continuing education needs for licensed contractors in Florida. Many of these positive determinants have been incorporated into the activity planning process and can be examined by reviewing the sample outline and budget.

Proposed Activity Budget

The budgeting strategy for continuing professional education should be to strive to provide the greatest benefit feasible to the largest number of participants at a minimal cost. Trainees must be able to demonstrate to others in their own professional setting what skills they acquired for the program to be truly cost-effective. Attempts to provide anything less will be construed poorly against both the provider and the participant. As a result, CPE providers must tailor sessions to the participants' experiences and entry skills by emphasizing varied issues and developing different levels of skills. The provider's purpose is to build transferability into as many aspects of the CPE activity as possible. Because competence- or performance-based training is specific to each participant, rigid cost-estimating formulas cannot be utilized to balance benefits and expenses. One must be

realistic in calculating an educational budget and must not trim curriculum content or skills practices in an effort to reduce the total cost. To do so would ultimately surface at some later date as deficiencies in the participants' performance.

The development of a sample competency-based CPE activity was crucial to illustrating the potential contributions of this study. The attempt herein was not to duplicate other currently available CPE activities offered by the many professional associations. However, a comparison has been conducted with four currently offered seminars to depict differences between operating in the different educational models. The activity cost for the previously cited courses is:

The Construction Specifications Institute - 475 dollars / 12 contact hours = $40 /contact hr.

The National Association of Home Builders - 125 dollars / 6 contact hours = $21 /contact hr.

The Associated General Contractors of America - 500 dollars / 36 contact hours = $14 /contact hr.

The Construction Financial Management Association - 225 dollars / 6 contact hours = $40 /contact hr.

Sample CPE Activity - 200 dollars /45 contact hours = $4.44 /contact hr.

Appendix Q contains all factors applicable to constructing a budget for the sample competency-based CPE activity. The most noted distinctions between the sample program and other offerings are both the total activity cost and duration. The formation of task-specific competencies and linkages is remarkably time consuming in contrast to the acquisition of knowledge.

Recommendations

The reader must recognize that no policy is fully capable of satisfying all concerned parties interests, nor of making all those affected better off. "Anyone who contends a policy is in the public interest must be prepared to meet the counter-argument that the policy really serves only a particular set of interests and neglects or penalizes others" (Wolfson, et al., 1980, p. 183). Still the state must ultimately strike a socially acceptable balance among all interests. The line of reasoning in all regulatory decisions should be laid out for scrutiny where relevant parties can have the opportunity to defend or challenge proposed policies.

The following are recommendations for consideration based upon this investigation into continuing professional education for the licensed contractor:

1. The need has been demonstrated for improved competence and performance of practitioners within the construction industry. However, this study remains remarkable because it evaluated only continuing professional education as an appropriate response. Alternative public or private strategies should be adequately considered before implementation of any regulatory intervention. Care must be taken to ensure that continuing professional education is not seen as a substitute for professional regulation since its existence lies solely in augmenting or supplementing. Continuing professional education, as currently structured, should not be used as evidence for practitioner competence.

2. The present time appears premature to require mandatory attendance in continuing professional education for licensed contractors as a condition of relicensure. Mandatory CPE is, however, currently accepted by practitioners to reactivate a licensee's inactive status or as a possible disciplinary tool. As an alternative, the state should encourage voluntary attendance in CPE to remedy deficient knowledge, skills, and competencies by making information readily accessible to interested parties on educational activities. The following educational information, as a minimum, could be dispensed through a newsletter-type publication:

   a. A list of construction related courses offered by existing public universities, colleges, and community colleges throughout the state (ref. App. J, p. 165)

   b. A list of construction related seminars and conferences sponsored by trade and professional associations held in Florida each year (ref. App. C, p. 122)

   c. Information to facilitate the position of future practitioners attempting to start and operate a construction business.

3. For the state to continue cooperative involvement with trade and professional associations, public higher education institutions, and/or any private organization, the state must establish performance guidelines for the various construction professions. An empirical study of the construction practices could be undertaken by observing a random sample of its practitioners to attain an understanding of current influences. This would reveal how a role is performed versus how others presume it ought to be played. Necessary levels of knowledge and skill required for matured, not entry-level, performance must be specified both in behavioral and practical terms. Bratton (1984b, p. 1), advocated adherence to the following principles with regard to competency issues:

a. The competencies should reflect the skills of a practicing professional, regardless of his/her current or previous job, position, title, or academic degree.

b. The competencies should be performance-oriented rather than academic-oriented.

c. While some employment situations may prevent an individual from exercising every competency, a professionally competent individual should be able to perform most, if not all, of the competencies when given the opportunity to do so.

d. The competencies should reflect the skills of experienced professionals, as opposed to students, educators, or entry-level practitioners.

Questions must then ultimately be posed weighing the findings with current entrance requirements to determine their sufficiency.

4. Efforts to determine how, or if, participants apply what they learned in a CPE activity are prerequisite for an activity to attain its objective. Administrators need the ability to document participant change(s) in competence related skills and day-to-day performance. Variant participant results must be accurately interpreted to determine linkages from which corrective action can be prescribed. Activity developers should devote specific attention to strategies that will facilitate participants' use of knowledge in their own environment. Standardized tests, sophisticated observation techniques, and other measurement strategies should be designed and employed regardless whether or not they require more time and resources than are currently available. Because misinterpretation of competence and performance issues are often the culprit when education measures fail, evaluation strategies must be designed alongside the activity's objectives. Great care must be taken in matching solutions with respective problems. Specifically, solutions should satisfy the following criteria:

a. Relevance — the material is needed and used on the job.

b. Transfer — information is used with equal or better proficiency on the job.

c. Design fidelity — programs, materials, and procedures must be implemented as planned.

d. Cost-effectiveness — solution costs less than the problem. (Smith and Corbett, 1976; Gilbert, 1967)

The economical transfer of knowledge to performance is the foremost challenge facing all education providers today.

5. The state may sponsor annual conferences for the construction practices similar to the currently successful annual conference for building officials in Florida (ref. App. K, p. 178). If successful, regional offering could next be implemented to better develop general construction-related competencies and field-specific performances. (ref. App. L, p. 181)

6. Many needs exist for significant improvement in research addressing construction methods, materials, and equipment, and in incorporating new technology into design and planning processes. Dramatic economic gains would potentially abound through the dissemination of research results. The Business Roundtable (1982), *Report B-2*, stated the following function's should be performed:

   a. Define the industry's needs (incl. consumers') for research and development. (ref. App. F, p. 151)

   b. Communicate these needs to the research and development community.

   c. Communicate the results of successful research and development programs to owners and potential users of construction technology. (p. 9)

These recommendations are concerned with the quality of service providers because of their supply-side orientation. This study did not explore demand-side intervention in the market. No recommendations were presented, yet two items for consideration were consistently found (e.g., Shimberg, et al., 1973; Wolfson, et al., 1980) in the literature review on demand or quantity intervention:

1. Require through regulation or statute that in particular circumstances, specific services should be performed.

2. Educate the consumer of informational problems which may lead to unnecessary demand generation.

Either approach may assist in executing the previously outlined recommendations. While the primary goal in quality regulation is to certify high standards, excessive quality measures may also constitute a problem. Quantity intervention could specifically satisfy third party and consumer interests more than any certification program.

Suggestions for Further Research

As a result of this study, several findings have surfaced. However, the study has also brought to light several areas where future research should be directed. The following is a list of potential research items:

1. Conduct further research focusing on personality characteristics and attitudes as determinants of participation in continuing professional education activities. This would have a practical application in the effective design and marketing of continuing professional education programs attempting to meet the needs of variant practitioners.

2. Test the final CPE model presented in this study (ref. Fig. 19, p. 109) to ensure its validity and to provide a basis for further model development.

3. Conduct research to develop competence-based and performance-based evaluation instruments to measure the success of a continuing professional education activity.

4. The reasons why attitudes differ according to professions should be further investigated. Isolating those factors that produce positive attitudes toward mandatory continuing professional education in some professions could assist in the planning and implementation of continuing education activities for other professions.

5. Investigate ways to encourage contact and communication between the licensed practitioner and the academic community. It would seem that improved communications should result in better educational programs as well as more opportunities for research.

6. Investigate the diversity of approaches and means through which individuals may acquire job skills.

7. Investigate the establishment of educational prerequisites for initial state certification.

APPENDIX A
LETTER REQUESTING INFORMATION FROM PROFESSIONAL ASSOCIATIONS

March 29, 1988

Association for Media-Based Continuing Education for Engineers
225 North Ave., N.W.
Atlanta, GA 30332

Attn: Continuing Education Department

Dear Sir or Madam:

The School of Building Construction at the University of Florida is conducting a feasibility study for the potential implementation by state authority of a continuing education program for licensed contractors.

Our goal is to integrate existing continuing education courses to develop an industry-state accepted form of professional development. Please forward information on your continuing education programs together with your calender of events including scheduled continuing education courses for 1988.

Please also send us the addresses of your local chapters in Florida.

Thank you for your attention.

Andrew E. Harris
Graduate Research Assistant

APPENDIX B
LIST OF PROFESSIONAL ASSOCIATIONS SURVEYED

List Of Construction Related Professional Associations Contacted

Associated Builders and Contractors

National Association of Home Builders of the United States

Southern Building Code Congress

American Building Contractors Association

International Council for Building and Documentation

Associated Air Balance Council

National Academy of Code Administration

Joint Committee on Tall Buildings

Building Contractors Association of America

American Institute of Constructors

American Society of Professional Estimators

American Subcontractors Association

Associated General Contractors of America

Association of Business and Professional Women in Construction

Professional Estimators Association of America

Construction Financial Management Association

Construction Management Association of America

Mason Contractors Association of America

Mechanical Contractors Association of America

National Association of Minority Contractors

National Constructors Association

National Electrical Contractors Association

National Roofing Contractors Association

Construction Specifications Institute

National Association of Cost Accountants

Institute of Cost Analysis

American Association of Cost Engineers

Engineering Contractors Association

American Society for Engineering Education

Institute of Industrial Engineers

American Society for Engineering Management

National Society of Professional Engineers

American Society of Mechanical Engineers

American Society of Civil Engineers and Architects

Society of Logistics Engineering

Association for Media-Based Continuing Education for Engineers

National Association of Accountants

National Association of Women in Construction

National Utility Contractors Association

United American Contractors Association

Post Tensioning Institute

International Association for Financial Planning

American management Association

American Society of Civil Engineers

National Association of Corrosion Engineers

American Association of Safety Engineers

National Fire Protection Association of America

APPENDIX C
EXISTING CONTINUING PROFESSIONAL EDUCATION COURSES
OFFERED BY RESPONDING ASSOCIATIONS

name of course	offered by	state	hours or units	fee
Quality Cost Estimating: Principles & Applications for Utility & Heavy Construction	American Association of Cost Engineers	NY	*	N/A
Project Evaluation and Risk Analysis	"	NY	*	N/A
Plant Shutdown and Turnabouts	"	NY	*	N/A
Basic Planning, Scheduling & Control	"	NY	*	N/A
Database Design for Computer-Aided Estimating	"	NY	*	N/A
Management of Engineering and Construction for Effective Project Control	"	NY	*	N/A
Conceptual Industrial Estimating	"	NY	*	N/A
Applied Project Management	"	NY	*	N/A
Estimating and Forecasting of Manufacturing Costs	"	NY	*	N/A
Cost Analysis for Complex Claims	"	NY	*	N/A
A Practical Project Monitoring	"	NY	*	N/A
Construction Estimating for Government Work	"	NY	*	N/A

name of course	offered by	state	hours or units	fee
Capital Cost Estimation	American Association of Cost Engineers	*	42	$168.00
Fundamentals of Project Management	"	*	42	$168.00
Capital Cost Esimation	"	*	*	N/A
Planning and Scheduling of the Design/Build Process	"	*	*	N/A
Cost Control	"	*	*	N/A
Procurement/Contracts	"	*	*	N/A
Project Cost Optimization	"	*	*	N/A
Cost Engineering	"	*	*	$295.00
Project Economics	"	*	*	$295.00
Code Provisions for Plumbing - Standard Code	Georgia Center for Continuing Education	GA	*	N/A
Building Inspection	Southern Building Code Congress International	AL	*	N/A
Computer Software for Building Departments	"	GA	*	N/A
Electrical Plan Review	"	AL,SC,TX	*	N/A
Hurricane Resistant Construction	"	TX	*	N/A

name of course	offered by	state	hours or units	fee
Management for Code Officials	Southern Building Code Congress International	GA	*	N/A
Mechanical Inspection	"	TX	*	N/A
One and Two Family Building Code Provisions	"	AL,FL,TX	*	N/A
One and Two Family Electrical Code Provisions	"	AL,FL,TX	*	N/A
One and Two Family Mechanical Code Provisions	"	AL,FL,TX	*	N/A
One and Two Family Plumbing Code Provisions	"	AL,FL,TX	*	N/A
Plan Review for Fire Safety	"	AL,NC,FL	*	N/A
Plumbing Inspection	"	GA	*	N/A
Rehabilitation and Preservation	"	GA	*	N/A
Significant Building Code Changes 1988	"	AL,GA	*	N/A
Structural Plan Review	"	AL,GA	*	N/A
Swimming Pool Code Provisions	"	GA	*	N/A
SBCCI Analysis of Significant Code Changes--Standard Building Code	Georgia Center for Continuing Education	GA	*	$54.00/$75.00
Problem Solving and Decision Making	The Associated General Contractors of America	FL	*	N/A

name of course	offered by	state	hours or units	fee
Contract Documents	The Associated General Contractors of America	*	*	N/A
Planning and Scheduling	"	*	*	$225.00/$250.00
Cost Awareness and Production Control	"	*	*	N/A
Safety: Accident Prevention and Loss Control	"	*	*	N/A
Project Management	"	FL	*	N/A
Foreman Training	"	*	*	N/A
Construction Law: Changes, Claims and Negotiations	"	*	*	N/A
Productivity Improvement	"	*	*	N/A
Construction Blueprint Reading	"	FL	*	$150.00/$175.00
Essentials of Management	"	FL	3	$150.00
Using Contract Documents	"	FL	3	$225.00/$250.00
How to Increase Your Building Profits In 1988/89. Improve Your Estimating, Pricing and Bidding	"	SC	*	$95.00
Winning With Style. Improve Your Marriage, Family and Business Relationships	"	SC	*	$35.00

name of course	offered by	state	hours or units	fee
You Can Negotiate Anything. Increase Your Effectiveness In Negotiating	The Associated General Contractors of America	SC	*	$95.00
First Aid and CPR Training	"	FL	12	$35.00
Building Layout	"	FL	*	$150.00/$175.00
C.A.M. Examinations	AMS "An Asssociation for Management Success"	*	*	N/A
Management Experience	"	*	*	N/A
Character	"	*	*	N/A
Leadership	"	*	*	N/A
Contributions to Effective Administrative Management	"	*	*	N/A
Permit Information Manual Workshop	The Florida Engineering Society	*	*	N/A
Surface Water Discharge Permitting	"	FL	31/2	N/A
Surface Water Management Permitting	"	FL	31/2	N/A
DER Jurisdiction and Permit Criteria	"	FL	31/2	N/A
Groundwater Discharge Permitting	"	FL	31/2	N/A
Basic Corrosion	National Association of Corrosion Engineers	*	3.2	$475.00/$550.00

name of course	offered by	state	hours or units	fee
Cathodic Protection - An Introduction	National Association of Corrosion Engineers	*	3.2	$475.00/$550.00
Cathodic Protection - Theory and Data Interpretation	"	*	3.2	$475.00/$550.00
Protective Coatings and Linings	"	*	3.7	$625.00/$700.00
Corrosion Control In Oil and Gas	"	*	3.2	$475.00/$550.00
Corrosion Fundamentals	"	*	0.7	$125.00/$150.00
Corrosion Control for Underground Storage Tanks	"	*	1.5	$295.00/$350.00
Corrosion Control by Protective Coatings	"	*	1.5	$295.00/$350.00
Professional Paint Foreman	"	*	1.4	$295.00/$350.00
Introduction to Coating Inspection	"	*	1.5	$295.00/$350.00
Corrosion Control for Water and Sewer Facilities	"	*	0.7	$175.00/$205.00
Technical Report Writing	"	*	0.7	$175.00/$205.00
NACE International Coating Inspector Training and Certification Program	"	*	*	N/A
Program for Cathodic Protection Personnel	"	*	*	N/A

name of course	offered by	state	hours or units	fee
Numerical Solution of Heat Transfer and Fluid Flow	The American Society of Mechanical Engineers	*	*	$525.00/$595.00
Cogeneration Systems: Engineering, Legal, and Financial Aspects of Project Implementation	"	*	2.1	$570.00/$640.00
Steam Turbine Fundamentals for Design, Operation and Maintenance	"	*	1.4	$720.00/$790.00
Pump and Valve Selection for Optimum System Performance	"	*	*	$700.00/$770.00
Failures, Failure Prevention and Repairs of Pressure Vessels, Piping, Boilers and Rotating Machinery, and Life-Extension Considerations	"	*	*	$700.00/$770.00
Vibration Analysis as a Predictive Maintenance Tool	"	*	2.1	$518.00/$580.00
Principles of Value Analysis/Engineering	"	*	*	$485.00/$555.00
Elevator and Escalator Code Requirement for Alterations, Maintenance and Existing Installations	"	*	*	$570.00/$640.00
Radioactive Waste Management for Nuclear and Other Facilities	"	*	*	$900.00/$995.00

name of course	offered by	state	hours or units	fee
Alteration and Repair Procedures for Boilers and Pressure Vessels	The American Society of Mechanical Engineers	*	*	$290.00/$360.00
ASME Boiler and Pressure Vessel Code: Section VIII, Division 1, Design and Fabrication of Pressure Vessels	"	*	2.8	$780.00/$850.00
Remaining Life Evaluation & Life Prediction of Pressure Vessel & Piping Components	"	*	*	$510.00/$580.00
Designing Fluid Components for Quality, Productivity and Safety	"	*	*	$555.00/$625.00
Failures, Failure Prevention and Repairs of Pressure Vessels, Piping, Boilers and Rotating Machinery, and Life-Extension Considerations	"	*	*	$700.00/$770.00
ASME Boiler and Pressure Vessel Code: Section IX, Welding and Brazing Qualifications	"	*	1.4	$690.00/$760.00
Geometric Dimensioning and Tolerancing	"	*	*	$700.00/$770.00
ASME Boiler and Pressure Vessel Code:: Section III, Class 1 Piping Analysis	"	*	*	$700.00/$770.00
ASME Boiler and Pressure Vessel Code: Section XI; Inservice Inspection of Nuclear Power Plant Components	"	*	*	$510.00/$580.00

name of course	offered by	state	hours or units	fee
Waterhammer and Fluid Structure Interaction in Piping Systems	The American Society of Mechanical Engineers	*	*	$510.00/$580.00
Project Management for Engineers	"	*	1.4	$790.00/$865.00
Priorities and Performance	"	*	*	$310.00/$390.00
Managing Project Under Pressure	"	*	* $1,065.00	$935.00/
ANSI/ASME B.31.1 Piping Design, Analysis and Fabrication	"	*	*	$700.00/$770.00
Centrifugal Pumps -- Their Characteristics and Applications	"	*	*	$485.00/$555.00
Nondestructive Testing -- Effective Utilization of Equipment Applications and Interpretations	"	*	*	$520.00/$590.00
Design and Processing of Plastic Parts	"	*	*	$485.00/$555.00
Metallurgical Failures In Boilers	"	*	*	$530.00/$600.00
Manufacturing Cost Estimating	"	*	*	$710.00/$780.00
How to Manage Changes	"	*	*	$290.00/$360.00
The Bolted Joint	"	*	1.4	N/A
Computational Fluid Mechanics: Low and High Speed Flows, and Heat Transfer	"	CA	*	$540.00/$610.00

name of course	offered by	state	hours or units	fee
Introduction to CAD/CAM Data Exchange & IGES	The American Society of Mechanical Engineers	CA	*	$260.00/$330.00
CAD/CAM On A Microcomputer A Hands-On Approach	"	CA	*	$670.00/$740.00
Knowledge-Based Expert Systems	"	CA	*	$495.00/$565.00
Mathematical Modeling and Digital Simulation for Process Control	"	CA	*	$700.00/$770.00
Specifications and Construction Contracts	The Construction Specifications Institute, Inc.	*	*	$425.00/$475.00
Fundamentals of Nonstructural Plan Review	International Conference of Building Officials	MN	*	$255.00/$345.00
Advanced Nonstructural Plan Review	"	CA,WA	*	$255.00/$345.00
Uniform Plumbing Code	"	CA	*	$255.00/$345.00
Uniform Fire Code	"	CA	*	$255.00/$345.00
Residential Electrical Inspection and Plan Review	"	CA	*	$255.00/$345.00
Uniform Building Code/Uniform Fire Code -- Plan Review and Inspection	"	WA	*	$255.00/$345.00
Combination Inspection -- Applications of the U.B.C., U.M.C., and U.P.C.	"	CA	*	$255.00/$345.00

name of course	offered by	state	hours or units	fee
35th Material Handling Management Course	Institute of Industrial Engineers	GA	3.1	$1,350.00/ $1,500.00
International Industrial Engineering Conference	"	FL	*	N/A
Essentials of Quality, Productivity, and Performance Management	"	AZ,DC,FL,MA	*	$680.00
Knowledge Worker Productivity Improvement Through Operation, Function Analysis	"	DC	*	$655.00
Gainsharing: A Strategy for Improving Operational Effectiveness	"	DC	*	$225.00/$255.00
Maintenance Management for Productivity	"	FL,PA,TX	*	$495.00/$575.00
White Collar Productivity Improvement Through Operation Function Analysis	"	FL	*	$675.00/$755.00
Bar Coding: From Implementation & System Expansion to Shop Floor Control	"	FL	*	$495.00/$575.00
How to Evaluate and Improve Manufacturing Systems	"	FL	*	$725.00/$825.00
Successful Cost Reduction Programs for Engineers and Managers	"	FL	*	$515.00/$595.00
Simulation: Improving Your Manufacturing Productivity	"	FL,PA,TX	*	$515.00/$595.00

name of course	offered by	state	hours or units	fee
Productivity & Quality Management Through Statistical Process Control	Institute of Industrial Engineers	FL	*	$515.00/$595.00
Effective Technical Communications Skills for Engineers and Management	"	FL	*	$495.00/$575.00
Applying Just-In-Time: The American/ Japanese Experience	"	FL,PA,TX	*	$495.00/$595.00
Managing the CIM Initiative	"	FL	*	$675.00/$755.00
Time & Motion Study Fundamentals	"	FL	*	$595.00/$675.00
Practical Plant Layout: A Step-By-Step Approach	"	FL,PA,TX	*	$675.00/$755.00
Introduction to IE	"	GA,MA,MI,WA	*	N/A
International Maintenance Conference	"	GA	*	N/A
Increasing Your Personal IE Effectiveness	"	AZ,MA	*	N/A
Operation Function Analysis	"	AZ,MA	*	N/A
IE Techniques in the Service Industry	"	AZ	*	N/A
Production Inventory Control	"	GA	*	N/A
Work Measurement and Methods Engineering	"	GA	*	N/A
Facilities Planning and Human Factors	"	GA	*	N/A

name of course	offered by	state	hours or units	fee
Quality Control and Statistical Analysis	Institute of Industrial Engineers	GA	*	N/A
Engineering Economics	"	GA	*	N/A
Course Outline and Standards	National Association of Plumbing - Heating-Cooling Contractors	*	*	$15.00
Lesson Plans	"	*	*	$125.00/$200.00
Student Workbooks	"	*	*	$35.00/$50.00
Plumbing Home Study Course	"	*	*	$500.00/$700.00
Illustrated Plumbing Code	"	*	*	$30.00/$40.00
The Expanding Role of the Construction Financial Manager	Construction Financial Management Association	GA,IL,MA,TX	*	$195.00/$225.00
Navigating the Changing Currents In Construction Financial Management	"	WA	*	$395.00/$525.00
The Effective QA/QC Program: How to Do It	American Society of Civil Engineers	DC,NY,CO,TN	*	N/A
Roofing Construction Techniques	"	AL	*	$450.00
Wind Loads for Building Design	"	AL	*	$495.00
Construction Computerization	Florida Atlantic University	FL	*	$125.00/$99.00

name of course	offered by	state	hours or units	fee
Introduction to Construction Methods, Materials, and Costs	New York Univeristy School of Continuing Education	NY	*	$545.00
Introduction to Building Systems	"	NY	*	$545.00
Fundamentals of Construction Management	"	NY	*	$545.00
Fundamentals of Construction Finance: A Practical Approach	"	NY	*	$275.00
Reading Construction Drawings and Blueprints	"	NY	*	$545.00
Blueprint Reading for Interior Construction and Renovation	"	NY	*	$545.00
Fundamentals of Construction Cost Estimating	"	NY	*	$545.00
Organizing and Managing the Construction Company	"	NY	*	$275.00
CM: A Professional Approach to Managing Construction	"	NY	*	$275.00
Project Planning, Scheduling, and Control	"	NY	*	$545.00
Managing Construction Field Operations	"	NY	*	$545.00
Electrical Power System Design for EDP Facilities	"	NY	*	$275.00

name of course	offered by	state	hours or units	fee
Construction Field Inspection: Structural Elements	New York University School of Continuing Education	NY	*	$275.00
Construction Field Inspection: Mechanical Systems	"	NY	*	$275.00
Managing Construction Documents and Records	"	NY	*	$275.00
Managing Commercial Interior Construction	"	NY	*	$545.00
Retail Building and Construction	"	NY	*	$275.00
Construction Monitoring	"	NY	*	$545.00
Preventing Construction Cost Overruns	"	NY	*	$545.00
Practical Construction Law: Dealing With the Most Common Causes of Construction Disputes	"	NY	*	$545.00
Construction Communication: What the Professional Has to Write and How	"	NY	*	$545.00
Sprinkler System Design	"	NY	*	$545.00
Complying With the New York City Building Codes, Zoning Laws, and Local Laws	"	NY	*	$545.00
New York City Electrical Codes	"	NY	*	$275.00

name of course	offered by	state	hours or units	fee
Obtaining Approvals, Permits, Variances, and Certificates of Occupancy in New York City	New York Univeristy School of Continuing Education	NY	*	$275.00
Fire Prevention Codes	"	NY	*	$545.00
Repair, Rehabilitation, and Upgrading of Existing Structures: Wood, Steel, and Concrete	"	NY	*	$545.00
Managing the Renovation Project	"	NY	*	$545.00
How to Inspect and Evaluate the Physical Condition of a Building	"	NY	*	$545.00
Elevator Maintenance and Modernization	"	NY	*	$275.00
HVAC for New Construction and Modernization: Choosing A System, Evaluating Performance, and Solving Operational Problems	"	NY	*	$545.00
Preventive Maintenance Programs for Buildings	"	NY	*	$275.00
Roofing Methods and Materials, Problems, and Corrective Measures	"	NY	*	$275.00
Facility Management	"	NY	*	$545.00
Programming and Planning Facilities	"	NY	*	$545.00
Successful Project Management Techniques	"	NY	*	$545.00MMan-

name of course	offered by	state	hours or units	fee
Managing Facility Operations and Maintenance	New York University School of Continuing Education	NY	*	$275.00
Operational Facilities Management/Budgeting	"	NY	*	$275.00
Managing Facilities Maintenance: Cleaning and Housekeeping	"	NY	*	$275.00
Construction Jobsite Automation Using A Personal Computer	"	NY	*	$545.00
Using A Personal Computer for Project Management and Scheduling	"	NY	*	$545.00
Introduction to Lotus 1-2-3 for Construction Professionals	"	NY	*	$200.00
Construction Management Applications Using Lotus 1-2-3	"	NY	*	$545.00
Introduction to Computer-Aided Design and Drafting	"	NY	*	$545.00
Cmputer-Aided Design and Drafting Using AutoCAD	"	NY	*	$545.00
Advanced AutoCAD: Menus, Tablets, and Symbols	"	NY	*	$545.00
Programming AutoCAD with AutoLISP	"	NY	*	$545.00

name of course	offered by	state	hours or units	fee
Asbestos Inspectors	New York University School of Continuing Education	NY	*	$470.00
Asbestos Management Planners	"	NY	*	$320.00
Asbestos Management in Public, Commercial, and Residential Real Estate Conference	"	NY	*	N/A
Specification Writing for Civil Engineering	Home Builders Institute	CA	*	$295.00/$345.00
Building Failures: Lessons From Past Mistakes	"	MN	*	$225.00/$275.00
Engineering Contract Documents	"	FL	*	$250.00
Steps in Legal Self Protection	"	TN	*	$225.00/$275.00
Selling to Design Professionals	"	AZ	*	$225.00/$275.00
Specifications and Construction Contracts	"	DC	*	$425.00/$475.00
Cad, Ove, Fastrack and Integrated Computerized Management Systems	"	DC	*	$375.00/$475.00
Business Planning for Growth	"	IN	*	$375.00/$475.00
Cash Flow, Budgeting, and Profit Planning	"	SC	*	$375.00/$475.00
Organization and Control In Small Volume Construction	"	CA,NC	*	$375.00/$475.00
Production Management for Owners/Managers	"	FL,MA	*	$375.00/$475.00

name of course	offered by	state	hours or units	fee
A Business Management Certificate Program	Home Builders Institute	GA,CA	*	$375.00/$475.00
Using CPM to Increase Productivity and Profit	"	FL,PA	*	$375.00/$475.00
Construction Management: The Superintendent's Job	"	NJ, SC,GA	*	$145.00
Finding, Financing and Developing Land	"	CA, MD,IL	*	$395.00/$495.00
Single Family Homes at Higher Density	"	FL,MI	*	$145.00
How to Win at the Zoning Table	"	FL, PA,NC	*	$145.00
Understanding Today's Buyer: Housing Needs and Future Trends	"	TX,CA	*	$395.00/$495.00
Marketing Management for the Home Building Industry	"	SC, CO,DC	*	$395.00/$495.00
Advertising, Promotion and Onsite Merchandising Strategies	"	AZ, LA,NJ	*	$395.00/$495.00
New Home Sales Management, Strategies and Training	"	DC, FL,IL	*	$395.00/$495.00
Finding Your Niche: Market Analysis, Feasibility and Land Development	"	CA	*	$495.00/$595.00
Managing for Profit	"	CO	*	$495.00/$595.00
Structuring the Deal	"	CO	*	$495.00/$595.00

name of course	offered by	state	hours or units	fee
Managing for Profit: Financing, Leasing and Property Management	Home Builders Institute	CO	*	$495.00/$595.00
Structuring the Deal: Taxation and Ownership, Planning and Design	"	CO	*	$495.00
Building for the Active Retiree	"	FL	*	$545.00/$645.00
Congregate Care Housing	"	DC	*	$545.00/$645.00
ABC's of Joint Ventures & Syndications	"	NV	*	$545.00/$645.00
Building Codes & Standards	"	CO, FL, IL, NY, OR, RI, VA, DC	*	N/A
Building Technology	"	FL, IL, OK, PA, RI, UT, VA	*	N/A
Business Management	"	MI, MN, NY, NC, OR, PA, VA, WY	*	N/A
Computer Applications	"	NY, NC, OK, UT	*	N/A
Construction Contracts and Law	"	FL, IL, IN, KY, MI, MN, NH, NY, NC, OH, OK, PA, RI, VA, MA,,WY	*	N/A
Energy Efficient Construction	"	IL, MI, NY, NC, OR, PA,WY	*	N/A

name of course	offered by	state	hours or units	fee
Estimating	Home Builders Institute	FL, MI, NY, NC, OK, OR,WA	*	N/A
Finance Banking	"	IL, IN, KY, MN, MO, NY,OH	*	N/A
Land Development	"	FL, IL, KY, MI, MO, NH, NY, NC, OH, OR, UT,WA	*	N/A
Project Management	"	CO, IN, MI, NY, NC, OK, OR, PA, UT,WA	*	N/A
Sales & Marketing	"	MI, MO, NY, NC, OH, OR,PA	*	N/A
Scheduling	"	CO, FL, NH, NC, OK,WA	*	N/A
Life Safety Code Seminar	National Fire Protection Association	FL	*	$625/$695
National Electrical Code Workshop	"	CA,MD,KY,NJ	*	$626/$695
Fire Alarm Systems Workshop	"	FL	*	$380/$425
Sprinkler Systems Workshop	"	FL	*	$515/$575

NA = No cost given.
* = Requested information not received.
/ = Nonassociation member fees.
Source: Information obtained from national professional associations, 1988.

APPENDIX D

SURVEY OF CONTINUING EDUCATION NEEDS FOR LICENSED CONTRACTORS IN FLORIDA

The School of Building Construction is currently studying the need for continuing education for licensed contractors in the state of Florida under a research grant sponsored by the Building Construction Industry Advisory Committee. We would appreciate your perspective on this issue to assist in pinpointing problems, needs, and developing future objectives. Please respond to each question appropriately and return this questionnaire prior to September 9, 1988. Thank You.

County _____
Construction Field _____
Years Held License _____

1. Should there be a mandatory continuing education program for all licensed contractors to renew their license?

___ Yes ___ No

2. If your answer above is no, should continuing education be required to reactivate a contractor's inactive status?

___ Yes ___ No

3. How many continuing education activities have you attended in the last two year period?_____

If you responded yes to either 1 or 2 above, please continue; otherwise skip the remaining questions and provide your explanation for the above negative responses at the end.

4. Please indicate the basic reason below which was or would be important to you in deciding to participate in a continuing education activity.

___ Self-satisfaction
___ Increase proficiency
___ Immediate practical benefit
___ Exchange thoughts with associates
___ Keep up with competition
___ Mandatory
___ Other _____

5. What members within the construction organization do you believe should participate in continuing education?

___ Licensee
___ Project Engineer
___ Project Manager
___ Superintendent
___ Other _____

6. If continuing education is mandated for contractors, should it also be mandated for the other following professions?

___ Architecture
___ Engineering
___ Surveying
___ Building Officials
___ Other _____

7. Continuing education would best support the construction industry by performing or improving which of the following functions?

___ Update
___ Competence
___ Performance
___ Other _____

8. What areas or topics should be addressed in continuing education?

___ Building Codes & Standards
___ Construction Contracts & Law
___ Project Management
___ Planning & Scheduling
___ Building Technology
___ Estimating
___ Project Safety
___ Ethics
___ Sales & Marketing
___ Computer Applications
___ Productivity Improvement
___ Building Failures: Lessons
___ Business & Finance
___ Development
___ Other _____

9. In terms of long-range usefulness, which of the following continuing education/workshop sessions would be helpful to you?

___ Lecture/formal presentation
___ Group discussions with persons in similar professional settings
___ Group discussions with persons in different professional settings
___ Informal interaction with colleagues
___ Informal interaction with presenters/resource people
___ Demonstrations
___ Guided hands-on instruction
___ Correspondence
___ Other _____

10. What continuing education activity duration would you be most able to attend?

___ Short course, 1-3 days
___ Evening course
___ Weekend course
___ Long course, greater than 3 days
___ Other _____

11. How many continuing education activities should one attend per two year period?_____

12. Where would you prefer to attend a continuing education activity?

___ Local
___ Region within Florida (100 mi)
___ Anywhere within Florida
___ Southeast United States
___ Anywhere in United States
___ Other _____

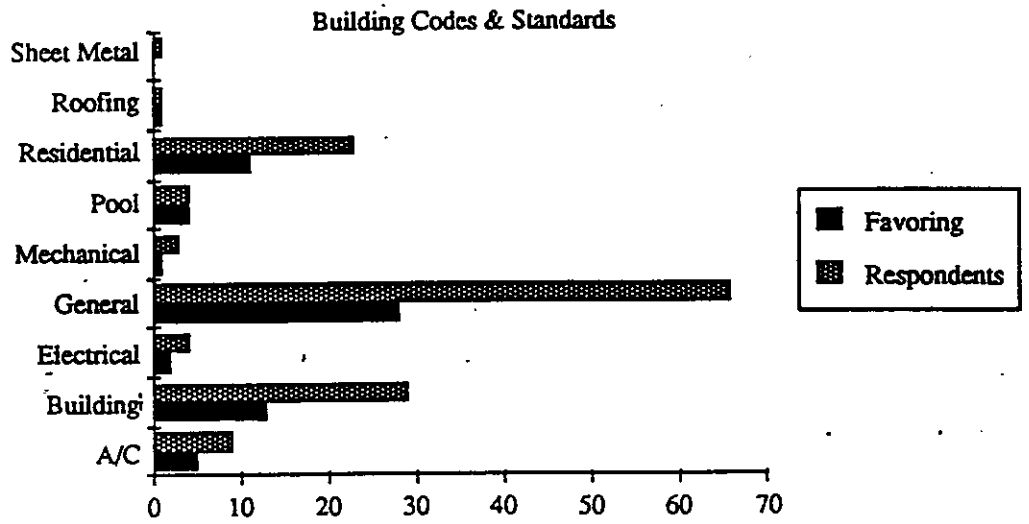
13. What would be a reasonable fee per continuing education activity?

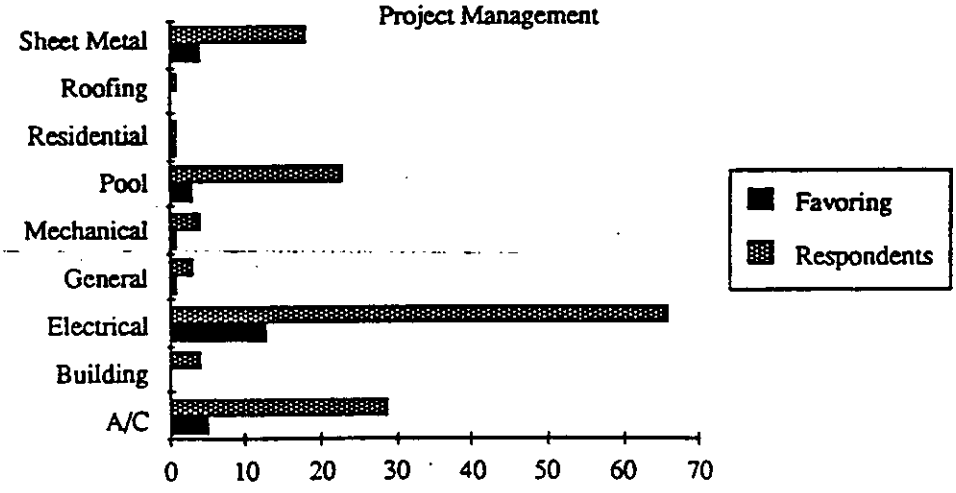
___ Under 100 dollars
___ Between 100 and 200 dollars
___ Over 200 dollars
___ Other _____

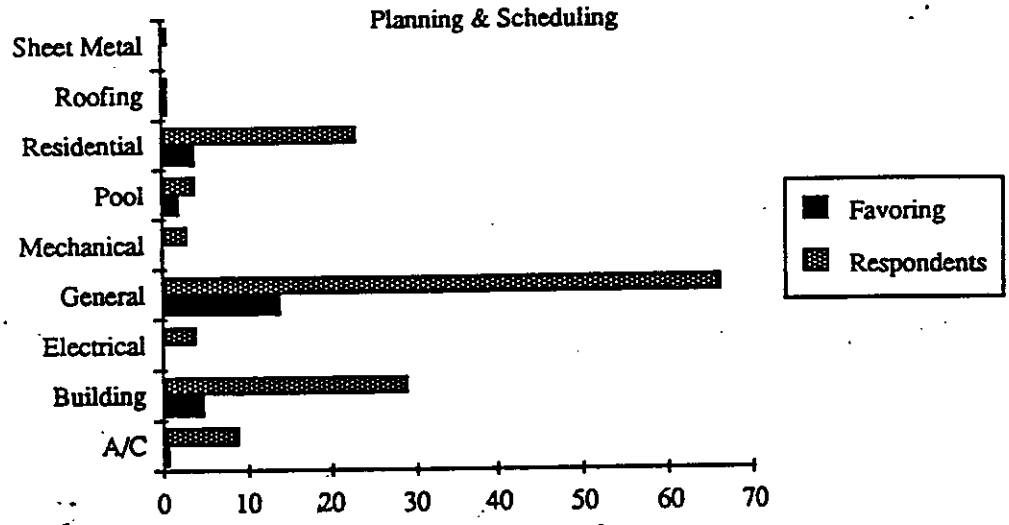
Please give any further comments on this subject you may have.

APPENDIX E

ANALYSIS OF CONTINUING PROFESSIONAL EDUCATION NEEDS BY CONSTRUCTION FIELD






Planning & Scheduling
Sheet Metal
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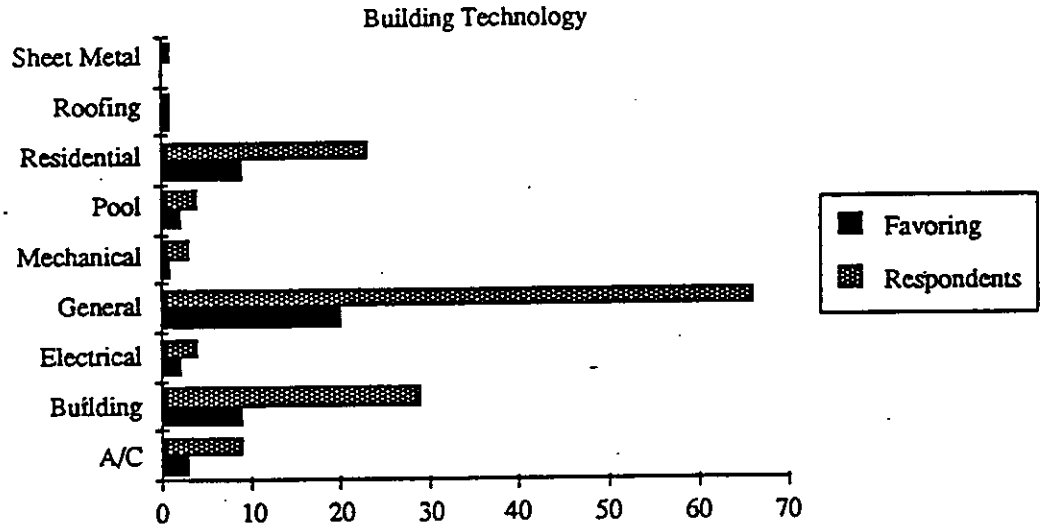
Favoring
Respondents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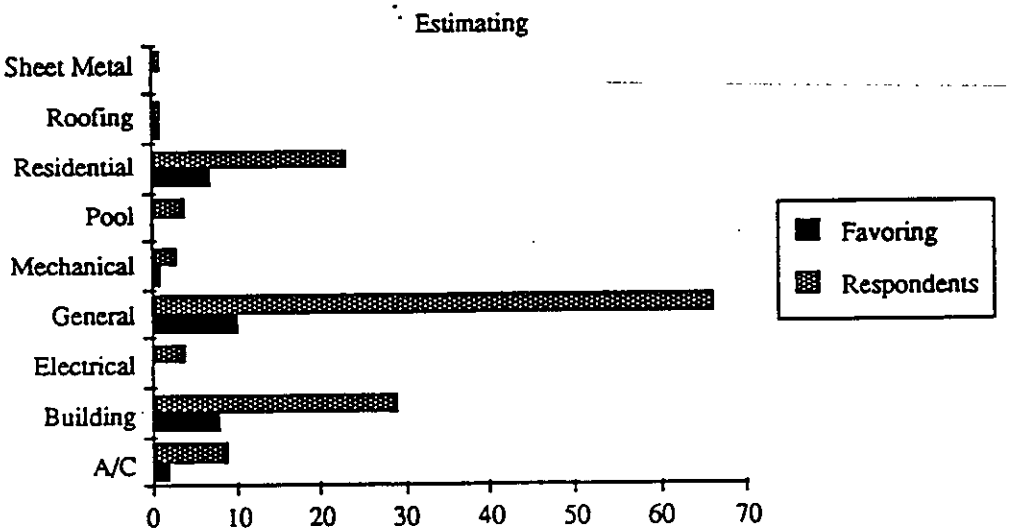
Favoring
Respondents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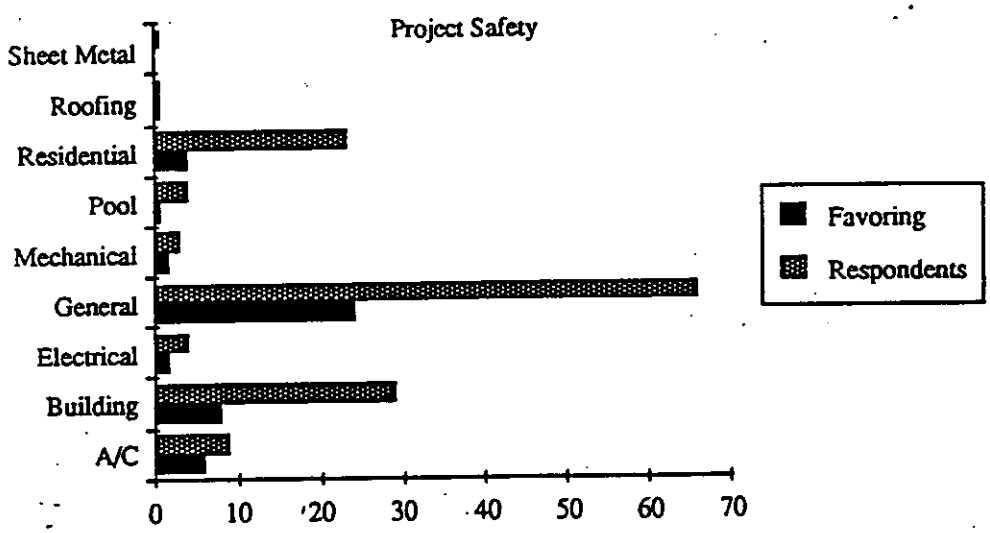
Favoring
Respondents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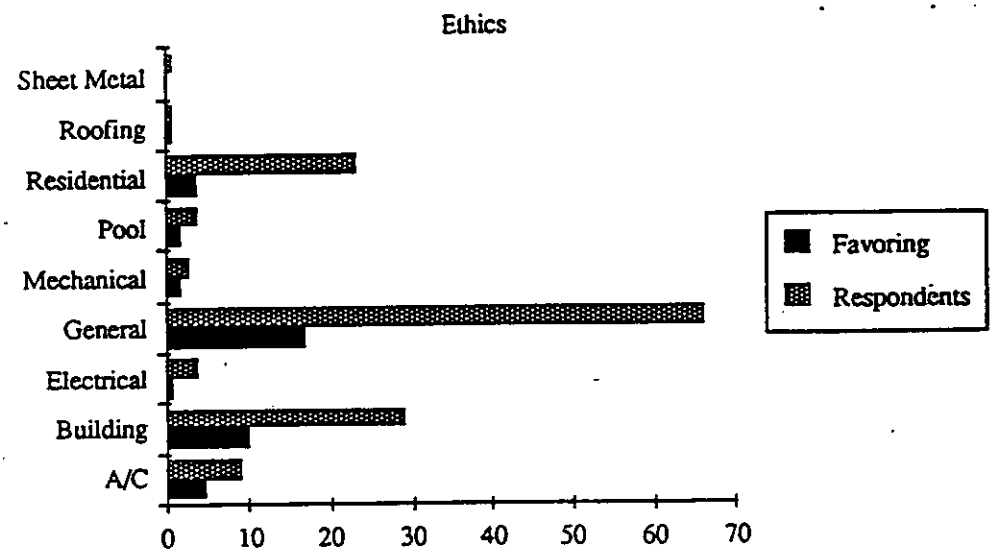
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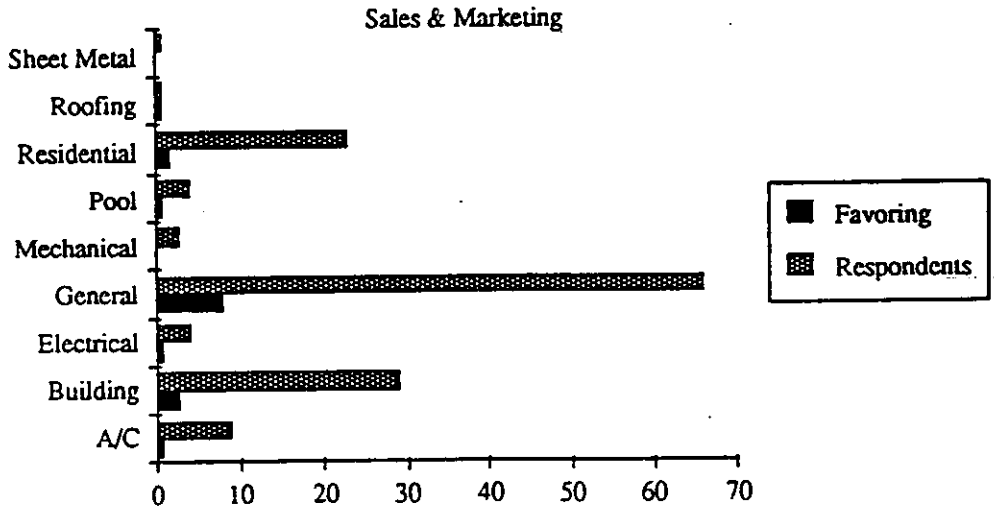
Respondents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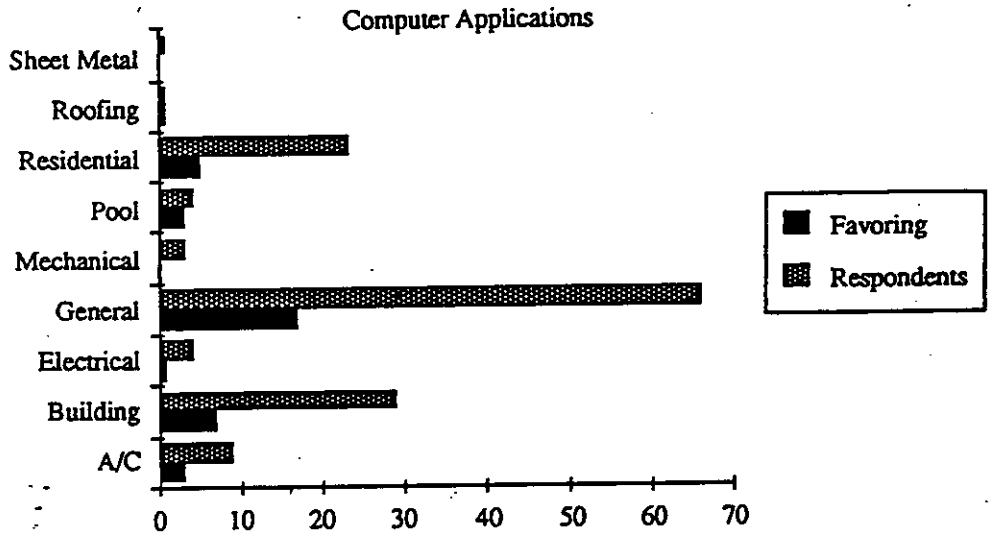
Favoring
Respondents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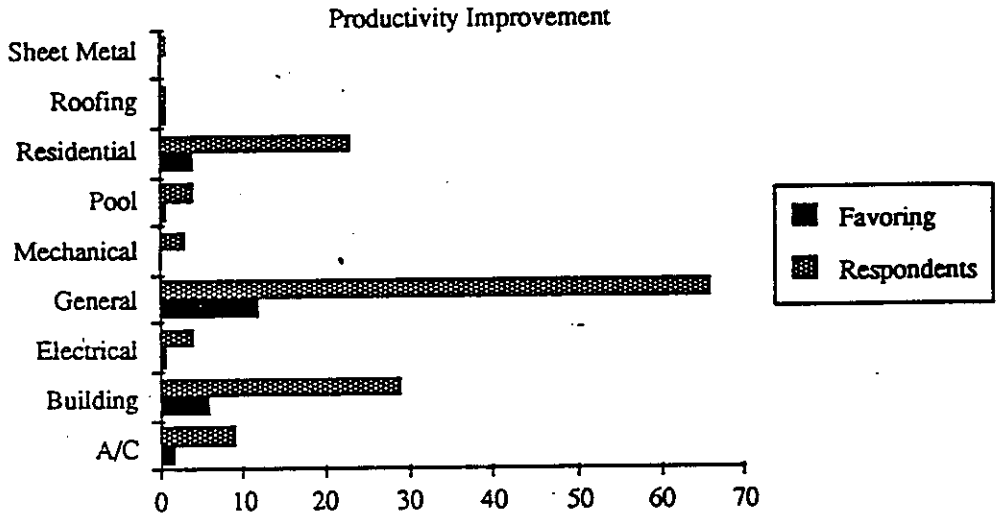
Favoring
Respondents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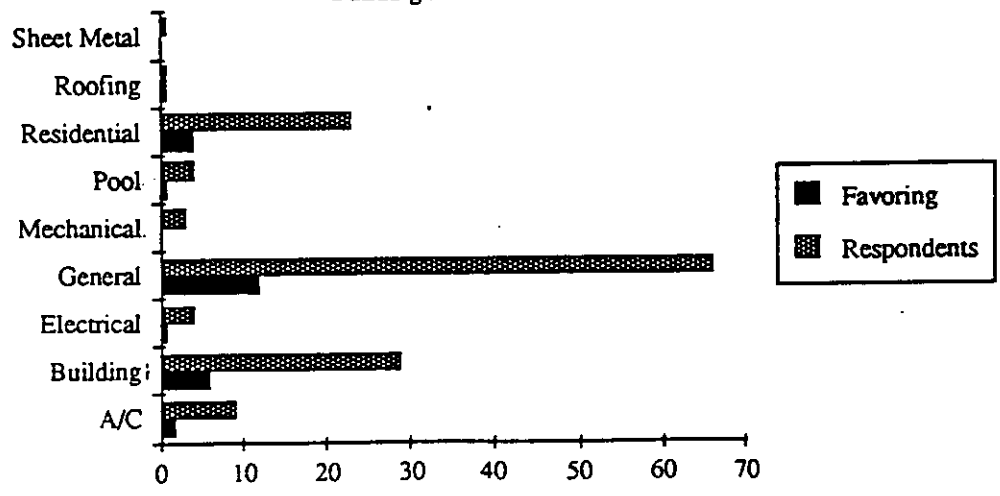
Favoring
Respondents


Building Failures: Lessons
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Favoring
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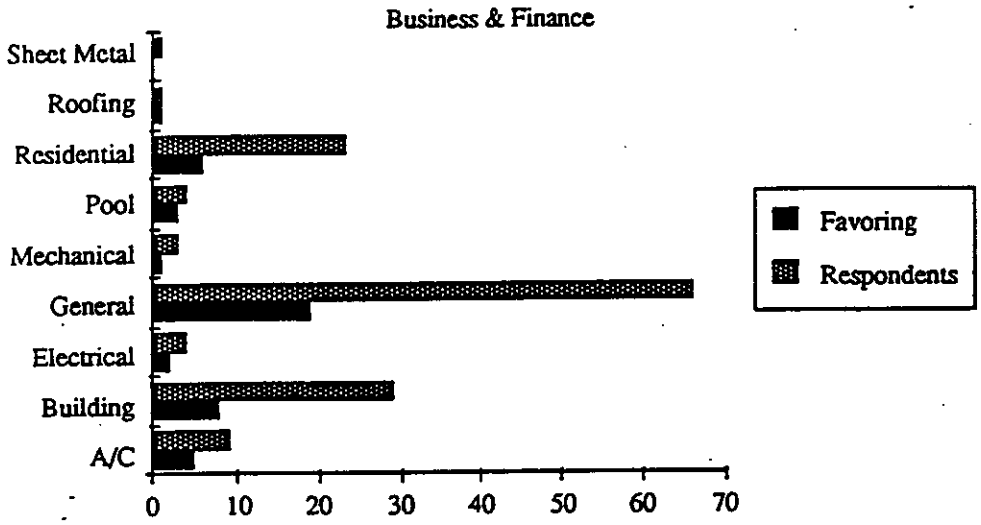
Business & Finance
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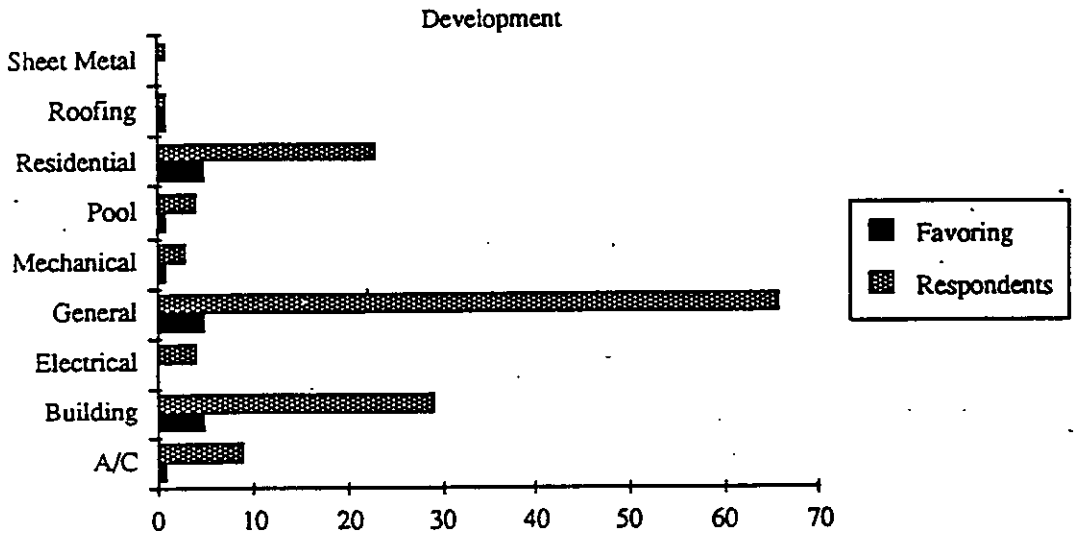
Favoring
Respondents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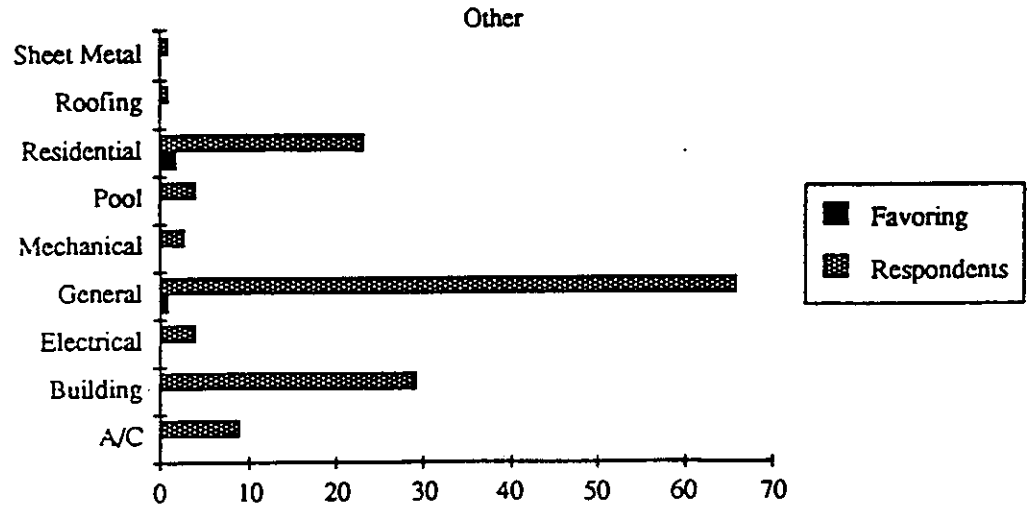
Favoring
Respondents


Other
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Favoring
Respondents

APPENDIX F
ANALYSIS OF CURRENT UNIVERSITY OFFERINGS AND RESEARCH WITH CURRENT INDUSTRY ATTITUDES

Project Activities

category (1)	type of respondent (2)	curriculum (%) full course (3)	part of course (4)	no course (5)	research (%) yes (6)	no (7)
		(a) planning and scheduling				
Bar Charts	C	9.5	87.6	2.9	53.8	42.6
	U	4.2	95.8	0.0	27.4	78.6
CPM	C	33.6	64.5	1.9	70.4	29.6
	U	28.0	72.0	0.0	70.6	29.4
PERT	C	5.8	74.4	19.8	51.6	48.4
	U	8.3	91.7	0.0	23.1	76.9
Other	C	10.0	65.0	25.5	41.7	58.3
	U	15.0	85.0	0.0	61.5	38.5
		(b) estimating				
Conceptual	C	29.3	68.7	2.0	65.3	34.7
	U	20.8	79.2	0.0	70.6	29.4
Quantity take-off	C	49.5	45.8	2.8	64.5	35.5
	U	25.0	75.0	0.0	28.6	71.4
Bidding	C	55.8	43.3	1.9	76.6	23.4
	U	20.0	80.0	0.0	47.1	52.9
Other	C	38.5	53.8	7.7	80.0	20.0
	U	15.4	84.6	0.0	50.0	50.0
		(c) project controls				
Product measurement	C	33.3	64.0	3.0	88.0	12.0
	U	16.0	80.0	0.8	76.5	23.5
Product improvement	C	31.7	67.3	1.0	93.9	6.1
	U	20.8	75.0	4.2	71.4	28.6
Cost control	C	57.1	42.9	0.0	89.9	10.1
	U	8.3	91.7	0.0	83.3	16.7
Quality control	C	33.3	65.7	0.1	88.2	11.8
	U	8.3	83.3	8.3	35.7	64.3
Operations research	C	9.2	64.3	26.5	61.4	38.6
	U	16.0	68.0	16.0	62.5	37.5
Track work	C	8.3	85.4	6.3	64.8	35.2
	U	8.3	79.2	12.5	42.9	57.1
Inspection	C	12.9	81.2	5.9	59.7	40.3
	U	4.2	79.2	16.6	8.3	91.7
Safety	C	32.4	65.7	1.9	79.5	20.5
	U	8.3	70.8	20.8	25.0	75.0
Administration	C	51.5	45.6	2.9	82.9	17.1
	U	11.1	77.8	11.1	15.4	84.6
Other	C	12.5	75.0	12.5	66.7	33.3
	U	0.0	100.0	0.0	20.0	80.0

Note: C = Contractors; U = Universities
Source: Oberlender & Hughes, 1987, p. 19

Business and Legal

category (1)	type of respondent (2)	curriculum (%) full course (3)	part of course (4)	no course (5)	research (%) yes (6)	no (7)
		(a)contract documents				
General condition	C	29.0	71.0	0.0	69.2	30.8
	U	26.1	73.9	0.0	25.0	75.0
Specifications	C	37.4	62.2	0.0	69.2	30.8
	U	26.1	73.9	0.0	20.0	80.0
Drawings	C	35.2	64.8	0.0	96.2	3.8
	U	19.0	76.2	4.8	0.0	100.0
Other	C	16.7	75.0	8.3	33.3	66.7
	U	30.0	60.0	10.0	0.0	100.0
		(b)business				
Accounting	C	67.3	27.1	5.6	67.1	32.9
	U	57.7	26.9	15.4	7.7	92.3
Economics	C	35.2	58.3	6.5	67.9	32.1
	U	59.3	31.3	9.4	0.0	100.0
Financing	C	49.1	46.2	4.7	77.2	22.8
	U	66.7	27.3	6.0	16.7	83.3
Marketing	C	55.2	40.0	4.8	81.8	18.2
	U	61.8	23.5	14.7	21.4	78.6
Other	C	25.0	50.0	25.0	40.0	60.0
	U	0.0	80.0	20.0	100.0	0.0
		(c) legal				
Contracts	C	58.1	41.0	0.9	76.0	24.0
	U	44.0	56.0	0.0	43.8	56.2
Bonds	C	15.0	81.3	3.7	66.7	33.3
	U	24.0	76.0	0.0	15.4	84.6
Insurance	C	17.0	79.2	3.8	65.3	34.7
	U	24.0	72.0	4.0	8.3	91.7
Liability	C	21.0	79.0	0.0	70.1	29.9
	U	27.3	68.2	4.5	15.4	84.6
Safety	C	22.3	73.8	3.9	73.0	27.0
	U	18.2	72.2	9.1	28.6	71.4
Other	C	12.5	62.5	25.5	50.0	50.0
	U	25.0	75.0	0.0	20.0	80.0
		(d) contract administration				
Type of contract	C	27.4	69.8	2.8	74.3	25.7
	U	16.7	83.3	0.0	30.8	69.2
Labor relations	C	36.8	59.4	3.8	78.7	21.3
	U	30.4	65.2	4.4	20.0	80.0
Other	C	15.4	69.2	15.4	50.0	50.0
	U	25.0	75.0	0.0	0.0	100.0

Note: C = Contractors; U = Universities
Source: Oberlender & Hughes, 1987, p. 21

category (1)	type of respondent (2)	curriculum (%) full course (3)	part of course (4)	no course (5)	research (%) yes (6)	no (7)
		(a) construction methods				
Formwork design	C	29.1	60.2	10.7	68.6	31.4
	U	16.0	72.0	12.0	25.0	75.0
Equipment Management	C	20.4	70.9	8.7	67.1	32.9
	U	36.0	64.0	0.0	35.7	64.3
Design of temporary structures	C	10.7	67.0	22.3	46.4	53.6
	U	14.3	47.6	38.1	33.3	66.7
Steel Erection	C	26.0	64.4	9.6	36.4	36.6
	U	4.2	54.2	41.6	0.0	100.0
Other	C	20.0	50.0	30.0	100.0	0.0
	U	25.0	37.5	37.5	0.0	100.0
		(b)materials				
Asphalt	C	8.9	74.3	16.8	55.2	44.8
	U	38.1	42.9	19.0	46.1	53.9
Concrete	C	34.3	57.8	7.9	69.1	30.9
	U	40.9	50.0	9.1	61.5	38.5
Timber	C	21.6	66.7	11.7	59.7	40.3
	U	22.7	59.1	18.2	41.7	58.3
Steel	C	24.0	69.0	7.0	66.7	33.3
	U	38.1	42.9	19.0	33.3	66.7
Other	C	25.0	43.8	31.2	100.0	0.0
	U	16.7	66.6	16.7	25.0	75.0
		(c) engineering				
Computers	C	74.1	24.1	1.8	91.1	0.9
	U	36.0	64.0	0.0	81.3	18.7
Mechanical	C	43.3	52.9	3.8	84.3	15.7
	U	10.5	42.1	47.4	10.0	90.0
Electrical	C	41.9	54.3	3.8	84.5	15.5
	U	15.8	36.8	47.4	30.0	70.0
Other	C	33.3	50.0	16.7	75.0	25.0
	U	0.0	66.7	33.3	0.0	100.0

Note: C = Contractors; U = Universities

Source: Oberlender & Hughes, 1987, p. 22

Supervision

category (1)	type of respondent (2)	curriculum (%) full course (3)	part of course (4)	no course (5)	research (%) yes (6)	no (7)
		(a) management				
Project	C	68.5	31.5	0.0	85.7	14.3
	U	33.3	66.7	0.0	75.0	25.0
Personnel	C	30.6	67.5	1.9	82.7	17.3
	U	20.8	62.5	16.7	25.0	75.0
Organizational	C	24.5	66.7	4.2	62.5	37.5
	U	29.2	66.7	4.2	62.5	37.5
Labor	C	43.9	53.2	2.8	78.1	21.9
	U	25.9	63.0	11.1	35.7	64.3
Time	C	19.4	73.1	7.4	68.8	31.2
	U	4.3	78.3	17.4	27.3	72.7
Safety	C	25.0	74.0	1.0	79.5	20.5
	U	8.3	79.2	12.5	18.2	81.8
Training	C	34.6	64.4	1.0	85.1	14.9
	U	4.5	59.1	36.4	20.0	80.0
Other	C	22.2	66.7	11.1	100.0	0.0
	U	14.5	71.4	14.5	33.3	66.7
		(b) communications				
Verbal	C	25.4	70.8	3.8	64.8	35.2
	U	12.5	66.7	20.8	0.0	100.0
Written	C	43.9	56.1	0.0	75.0	25.0
	U	16.7	66.6	16.7	10.0	90.0
Reports	C	25.5	74.5	0.0	69.4	30.6
	U	16.7	70.8	12.5	0.0	100.0
Other	C	8.3	83.3	8.3	33.3	66.7
	U	10.0	75.0	15.0	20.0	80.0

Note: C = Contractors; U = Universities

Source: Oberlender & Hughes, 1987, p. 20

Specialty

category (1)	type of respondent (2)	curriculum (%) full course (3)	part of course (4)	no course (5)	research (%) yes (6)	no (7)
		(a) construction methods				
Sales	C	39.2	46.1	14.7	78.6	21.4
	U	0.0	42.9	57.1	0.0	100.0
Mechanical	C	44.5	52.5	3.0	81.2	18.8
	U	0.0	81.8	18.2	0.0	100.0
Plumbing	C	38.4	56.6	5.0	80.6	19.4
	U	0.0	28.6	71.4	0.0	100.0
Electrical	C	48.0	49.0	3.0	79.5	20.5
	U	0.0	38.1	61.9	11.1	88.9
Roofing	C	21.6	66.0	12.4	76.9	23.1
	U	4.5	36.4	59.1	22.2	77.8
Earthwork	C	22.2	68.7	9.1	72.7	27.3
	U	12.5	79.2	8.3	42.9	57.1
Utilities	C	19.2	73.7	7.1	70.1	29.9
	U	5.0	25.0	70.0	0.0	100.0
Paving	C	16.0	68.0	16.0	67.2	32.8
	U	13.6	59.1	27.3	27.3	72.7
Bridges	C	28.0	51.6	20.4	67.7	32.3
	U	4.8	57.1	38.1	0.0	100.0
Industrial	C	34.0	57.7	8.3	75.4	24.6
	U	18.2	36.4	45.5	20.0	80.0
Process	C	28.2	59.8	12.0	71.0	29.0
	U	5.0	35.0	60.0	11.1	88.9
Other	C	50.0	30.0	20.0	50.0	50.0
	U	0.0	37.5	62.5	0.0	100.0

Note: C = Contractors; U = Universities

Source: Oberlender & Hughes, 1987, p. 23

APPENDIX G
COMMENTS AND SUGGESTIONS SOLICITED FROM LICENSED CONTRACTORS

The following text are comments submitted from certified contractors throughout the state of Florida in response to the School of Building Constuction's Survey of Continuing Education Needs for Licensed Contractors in Florida.

1. We have enough "Big Brother" control already. Present building inspectors assure ample code requirements. State employees need to be re-educated and policed far more than businessmen who are generating the cash to pay for the surplus state overhead. Thank You.

2. Those wishing to reactivate their license and all who have received disciplinary action concerning misuse of their license should participate in continuing education.

3. I personally do continuing education study in many areas. I find that listening to tapes while driving between jobs works well for me. I don't feel that mandatory courses are needed – rather they should be by choice. I would be interested in tapes on many of the above subjects.

4. The education is needed more for the non-practicing license holder, not the active contractor.

5. A mandatory educational program for license renewal will become a financial bonanza for unqualified workshops.

6. The license is a joke: the architect engineers the job, my estimator estimates it, my foreman or supervisor builds it, the inspector inspects it, and I run the office (business). Three of my last ten jobs I never looked at. I made 1.3 million dollars (net) last year and only went to the eighth grade. I haven't used ten minutes of anything I learned at G.C. School. Ask Frank J. Rooney if he could pass the test today. He told me he'd hire a G.C. at 25 thousand dollars a year first.

7. My experience with continuing education is that it is a total waste of time and money.

8. This would allow for financially stronger people to continue their insurance and thereby keeping their license active.

9. The construction industry does not need more government regulations. I think we should recertify teachers every two years.

   I would like to take a course which would teach me how to do the energy calculations for buildings. Also, I would like to take another for beam, and joist design.

   I think mandatory continuing education for contractors would be a big mistake. As an added burden to licensed contractors it would again have to raise construction costs of all permit jobs and government work. The result would be higher taxes and higher costs for everything you buy or use. With increasing governmental fees and regulations coming all the time it is difficult to keep costs down without adding more burden.

Ninety-five percent of my work as a contractor is non-permit. Everyone is looking for the lowest possible price. By raising the cost for licensed people you are simply pushing more work to the unlicensed workers. If you needed work done on your house, would you hire a licensed contractor if you know a handyman who could do a good job for less money? I am absolutely certain you would. The handyman doesn't have to pay for liability insurance; workmen's compensation insurance; the tremendous cost of government requirements such as taxes, licensing fees, etc.; and the lost time to do the job legalities.

I am wondering if the real thought behind this isn't to put more money in the pockets of educators and government officials, those who will receive the money, and therefore cause a lower standard of living on all the rest. This attitude of making the other person pay me more and carry more of the load is what is causing our industries to be priced out of the market by foreign competition – typical union-type thinking.

The continuing education program should be there as an aid to the industry: teaching young people how to do electrical work, plumbing, brick and block laying, or plastering, instead of forcing the contractor to do on- the-job training and thus paying double or triple for the mistakes. It should also be there to help a contractor to learn to use a computer, do energy calculations, or any other special things required by the code. Attending required courses for code review sessions is not a help.

10. All of the "continuing education" programs I have been to in the past were put on by people who were in the business of workshops and were not very knowledgeable about current events in the "real world."

11. Go to Russia or China if you want mandatory! What we don't need is more loss of freedom, more restrictions, and especially more cancerous growth of the government.

    No more government. No more loss of freedom of choice. No more rules and regulations. No more cost to do business. No more cost of our hard earned money to provide more paper work, please!

12. If someone has already qualified for their license, continuing education should be optional and available. There are a lot of seminars and classes I would like to take at my convenience.

13. I feel that if a contractor is engaged in a day to day business, he either keeps up by reading or continuing education on his own or he will soon go broke.

14. Education is furthered through on the job experience with our company. Work schedules and travel prevent classroom education in most cases.

15. I feel any continuing education program for licensed contractors would be another unnecessary bureaucratic burden placed on contractors who already are faced with enough problems from high insurance rates, building costs, labor costs, and excessive competition from unlicensed contractors. The primary problem remains, for small contractors like myself, that there are too many unlicensed contractors in direct competition. How is this going to help me? I already have both a B.S. and M.B.A. degree and I don't need more red tape and costs, please!

16. Why don't you put together a video course that can be borrowed and watched at my own schedule. Small seminars could be organized locally where subjects could be discussed and/or tested.

17. I do not believe in continuing education courses. Had one in real estate and didn't find it useful.

18. Assure initial requirements by inducting only qualified contractors into the profession.

19. I believe that education becomes a less important aspect of a successful, intelligent, and responsible activity as experience grows. Furthermore, as diversity comes with age and experience, regulations have no way of directing educational requirements meaningful to an individual.

20. Whatever is done to help the construction industry be fair to those who are trying to be good contractors and very strict on those who break the rules and laws.

21. Daily field experience is much more valuable than any continuing classwork.

22. Every jurisdiction has its own interpretation of codes, laws, etc., and each market area has its own requirements. Statewide training is too broad to be of much use.

23. Weed out inactive contractors that are not serious about their license.

24. Forget the whole idea! I passed with a 91 percent score and am too busy to keep having to do more government crap like this. Get off our backs!

25. Any builder who wants continuing education can get it now. We have H.B.C.A., G.B.I. class. The A.G.C. has schools. This will not give us quality construction. Teach our kids ethics.

26. It is sort of unfair to force people to take classes and then charge them with any more than a nominal fee. There are a lot of contractors that need classes because they have no experience at all. I always think of it as a general contractor doing open heart surgery. Very scary, isn't it.

    The problems of the construction industry, in Florida especially, is the availability of licenses to totally unqualified people. The industry is filled with people holding licenses that are teachers, lawyers, doctors, and general business people, with absolutely no experience at all. The number of contractors that are holding licenses and are actually doing any work or even supervising their projects is staggeringly low. I personally have built and worked on all types of projects in my nine years in Florida, and the problem is still the same. It is truly sad that so many people who should not have licenses have them.

    If any of these suggestions seem incorrect to you, I'm sure that you are not really aware of what goes on in the construction industry.

27. The biggest problem is going by the law and still being competitive with those who disregard the law. For example: if I have a carpenter that makes $12.50 per hour, pay $14.36/100 on workmen's compensation, 7.5 percent social security, and 6.17 percent unemployment, I can't compete with the man who pays $10.00 per hour and doesn't withhold insurance.

28. I have held a Certified General Contractors License since 1976. I have worked as a general contractor since 1948. We have a small construction company and gross from 1 to 1.4 million dollars a year. I know how to estimate and build or I would not have been in business for 40 years. When I took the test to become certified I had to go to a school, not to learn how to build, but to learn how to answer questions that teachers could ask. First you give a plan that doesn't scale (no contractor would touch a plan like this) and we have to play hunt and seek with it. I did not learn any secrets or how to play hunt and seek with it. I did not learn any secrets or how to run my business any better by being certified! I would hate to have to go through a Mickey Mouse course every year or two to stay certified.

29. Continuing education is not the solution for incompetent contractors. Stricter and more difficult original license requirements will help prevent borderline persons from attaining the license. One cannot continue an education if one did not have an education to start. For continuing education to be required their education must be mandatory to begin with, much like the BCN program at the University of Florida.

30. I have been attending continuing education courses for real estate for years and find it to be a waste of time.

31. I believe this gives just another expense which a person does not need. For a contractor to do his or her work properly, it does not depend on a test that can be copied and sent in.

32. There are many laws and regulations now, and we do not need another requirement added to take more of our time! It is no longer a free country.

33. Continuing education is a means of reducing the number of licensed contractors and increasing the bureaucracy.

34. I am for continuing education, but that it should not be mandatory.

35. A correspondence course or lecture course with materials similar to the Berit Rogers real estate course would be nicer than a mandatory three day or weekend course.

36. There would be lots of overlap with the real estate courses. Perhaps the Department of Professional Regulation could combine some of the course requirements so builders could obtain a broader perceptive.

37. Would like to see this develop into at least a required associate degree program.

    Specialized fields of construction should be taught (residential, commercial, institutional, hospital, high-rise, etc.).

38. A person proves his or her proficiency by passing an exam. He should then be able to keep abreast of changes within the industry if he or she remains active.

39. When an indiviudal gets their license, they should have a working knowledge of everything listed under question eight. Further education should be optional and should be locally held or through correspondence.

40. I believe mandatory continuing education would be unfair and a needless expense to licensees. Any licensee is constantly trying to improve his skills and government supervision is uncalled for. Stricter policing of licensees and eliminating the law breakers would be better.

41. Let's license everyone and pull the license of the incompetent license holders immediately.

42. We do not need any more bureaucracy than we already have now.

43. I don't think continuing education should be mandatory since there are so many numerous levels of experience, knowledge, and sophistication among contractors that what might be useful for one individual would be just too basic for others.

44. We have enough harassment by governmental agencies as it is now. No more rules and regulations are needed. They should spend their time and efforts going after the unlicensed contractors of Florida.

45. It is my opinion that those people who have passed the test and are involved in the business daily know what they are doing. In addition, those who are inactive and then reactivate their license don't forget what they used to do. I feel it would be a waste of time and money.

46. I believe that some exemptions should be considered. For example: those people who donate their time to serve on license boards or construction boards should be given credit.

47. Classroom attendance does not insure quality construction. We are over regulated now – enough is enough.

48. The biggest problem with the industry is ethics and lack of experience. Continuing education under your terminology is not needed – we get it every day at work. Work weeks are already 50-70 hours. I don't need more time in a classroom. If some contractors want more classroom work, let them go voluntarily but not mandatorily.

49. Construction, especially residential and smaller commercial buildings is not an esoteric subject. The developments in construction cannot be compared to a field like medicine. Active involvement in construction plus a little reading will keep most contractors up-to-date in their field. Let's not convince ourselves that construction is an intellectual discipline!

50. I think building inspectors should be licensed in the field they inspect.

51. Continuing education activities should be voluntary, with possibly proof of participation being furnished.

52. The addition of Continuing Education Bill (H.B. 72) to the maintenance of a state certified contractor's license is ridiculous. I've been in the general contracting business for over 25 years. Trying to keep up with the constant changes in local, county, state, and federal regulations is an education by itself, not to mention trying to keep up with the new technology coming out every day. I trust you will do everything in your power to see this amendment will not be added to the maintenance of a state certified license.

53. The contractor must pass one the toughest tests in the nation to get his license. That should speak for itself. Continuing education will not make him a better contractor. It would cost him money and time!

54. I have worked very hard and have spent a lot of money to obtain this license. I am doing fine and don't need continuing education to see if I am qualified. This is additional pressure, time, and cost which is not needed. Once the state exam is passed and one obtains their license, it is for life.

55. We are regulated enough. All work performed is inspected by government already, and if work is not performed correctly, stop gaps are in place for enforcement. No new laws are necessary to regulate the construction industry at this time.

56. General contracting is a continuing education. The actual running of a business keeps the contractor up-to-date. Until they standardize the lien laws, reeducation will make no sense. I recommend that subcontractors be tested.

APPENDIX H

ABSOLUTE RESPONSES TO THE SURVEY OF CONTINUING EDUCATION NEEDS FOR LICENSED CONTRACTORS IN FLORIDA

The School of Building Construction is currently studying the need for continuing education for licensed contractors in the state of Florida under a research grant sponsored by the Building Construction Industry Advisory Committee. We would appreciate your perspective on this issue to assist in pinpointing problems, needs, and developing future objectives. Please respond to each question appropriately and return this questionnaire prior to September 9, 1988. Thank You.

County _____
Construction Field _____
Years Held License Avg. = 12.87

1. Should there be a mandatory continuing education program for all licensed contractors to renew their license?

39 Yes 119 No

2. If your answer above is no, should continuing education be required to reactivate a contractor's inactive status?

59 Yes 60 No

3. How many continuing education activities have you attended in the last two year period? Avg. = 1.4

If you responded yes to either 1 or 2 above, please continue; otherwise skip the remaining questions and provide your explanation for the above negative responses at the end.

4. Please indicate the basic reason below which was or would be important to you in deciding to participate in a continuing education activity?

19 Self-satisfaction
61 Increase proficiency
31 Immediate practical benefit
26 Exchange thoughts with associates
28 Keep up with competition
10 Mandatory
4 Other _____

5. What members within the construction organization do you believe should participate in continuing education?

81 Licensee
30 Project Engineer
43 Project Manager
40 Superintendent
2 Other _____

6. If continuing education is mandated for contractors, should it also be mandated for the other following professions?

75 Architecture
70 Engineering
41 Surveying
81 Building Officials
1 Other _____

7. Continuing education would best support the construction industry by performing or improving which of the following functions?

45 Update
63 Competence
37 Performance
2 Other _____

8. What areas or topics should be addressed in continuing education?

76 Building Codes & Standards
61 Construction Contracts & Law
29 Project Management
30 Planning & Scheduling
52 Building Technology
33 Estimating
52 Project Safety
47 Ethics
19 Sales & Marketing
41 Computer Applications
29 Productivity Improvement
51 Building Failures: Lessons
51 Business & Finance
19 Development
3 Other _____

9. In terms of long-range usefulness, which of the following continuing education/workshop sessions would be helpful to you?

54 Lecture/formal presentation
30 Group discussions with persons in similar professional settings
12 Group discussions with persons in different professional settings
10 Informal interaction with colleagues
20 Informal interaction with presenters/resource people
26 Demonstrations
27 Guided hands-on instruction
27 Correspondence
3 Other _____

10. What continuing education activity duration would you be most able to attend?

49 Short course, 1-3 days
30 Evening course
37 Weekend course
3 Long course, greater than 3 days
8 Other _____

11. How many continuing education activities should one attend per two year period? Avg. = 1.7

12. Where would you prefer to attend a continuing education activity?

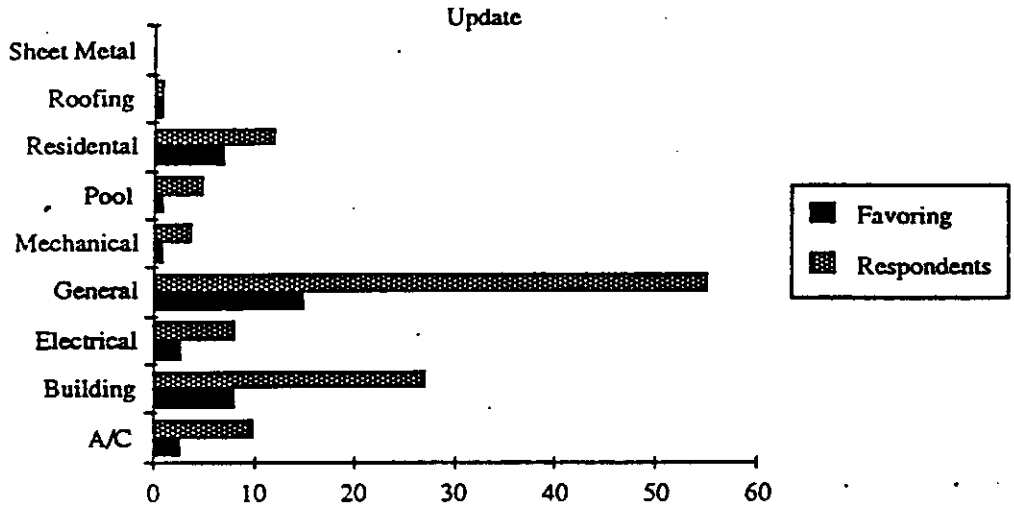
63 Local
31 Region within Florida (100 mi)
10 Anywhere within Florida
2 Southeast United States
0 Anywhere in United States
1 Other _____

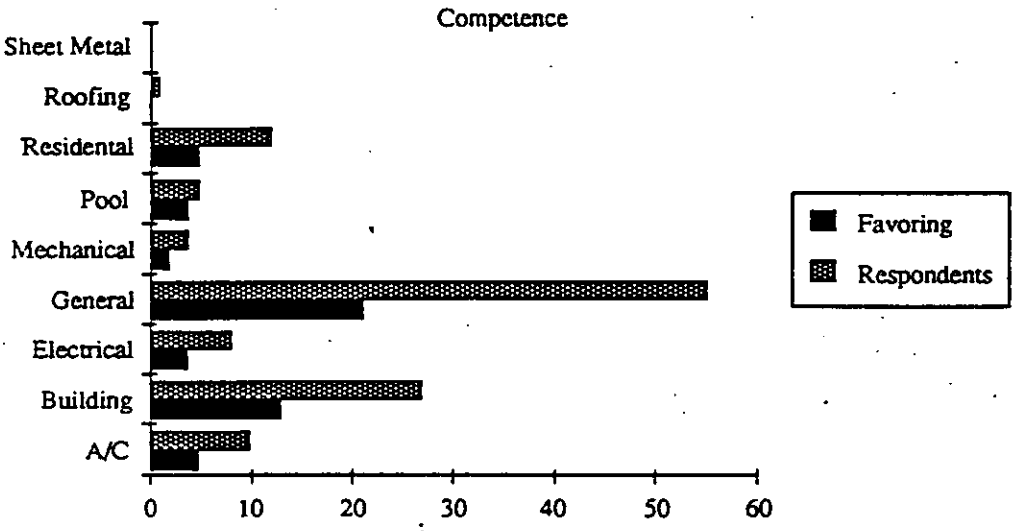
13. What would be a reasonable fee per continuing education activity?

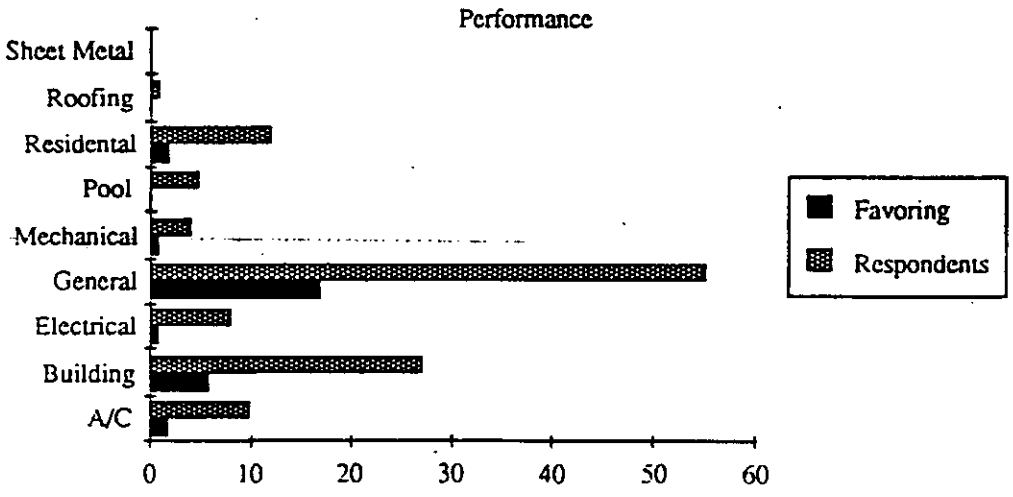
54 Under 100 dollars
31 Between 100 and 200 dollars
3 Over 200 dollars
3 Other _____

Please give any further comments on this subject you may have.

APPENDIX I
ANALYSIS OF CONTINUING PROFESSIONAL EDUCATION
ORIENTATION ATTITUDES BY CONSTRUCTION FIELD







APPENDIX J
EXISTING CONSTRUCTION EDUCATION COURSES OFFERED FROM
PUBLIC HIGHER EDUCATION INSTITUTIONS IN THE STATE OF FLORIDA

Brevard Community College

ARC 1120C - architectural drafting
BCT 0931 - special topics in cabinetmaking
BCT 0932 - special topics in basic plumbing
BCV 0011 - building construction I
BCV 0012 - building construction II
BCV 0931 - special topics in building construction
ETD 2030C - freehand drawing
ETD 2320C - computer-aided drafting I
ETD 2351C - computer-aided drafting II
ETD 2614C - electronic drafting
ETE 1301 - national electric code & electrical safety
ETM 2631 - air-conditioning systems
ETM 2630 - air-conditioning equipment
ETM 2651 - air-conditioning controls II
ETM 2103C - solar energy applications
FFP 0224 - fire prevention inspection theory
FFP 1000 - introduction to fire safety
FFP 2210 - fire investigation
FFP 2620 - fire protection systems

Broward Community College

ARC 1126 - architectural drafting I
ARC 2020C - architectural communications
ARC 2031 - architectural design I
ARC 2032 - architectural design II
ARC 2122 - architectural drafting II
ARC 2140C - materials & methods of construction
ARC 2154 - architectural drafting III
ARC 2580 - structures I
ARC 2681 - environmental technology
BCN 1272 - building construction plans interpretation
BCN 1610 - building construction estimating fundamentals
BCN 1740 - building construction law
BCN 1750 - building construction financing
BCN 1930 - building construction special topics
BCN 2561 - mechanical & electrical systems
BCN 2614C - construction planning & scheduling
BCN 2704 - building construction insurance

BCN 2742 - contractors license preparation
ETC 1250 - materials & processes
ETC 2410 - structural design
ETE 1223L - materials testing lab
ETD 1111 - technical drafting
ETD 1342 - basic CAD
ETG 2530 - strength of materials
ETG 2530L - strength of materials lab
IND 1020 - interior design I
IND 1200 - interior design II
IND 2420 - materials & sources
SUR 2001 - surveying I
SUR 2001L - surveying I lab
SUR 2200C - route surveying

Central Florida Community College

BCN 1002 - construction shop practices
BCN 1200 - materials & methods of construction
BCN 1610 - construction estimating fundamentals
BCN 2251 - architectural drawing I
BCN 2253 - architectural drawing II
BCN 2450 - structural design I
BCN 2451 - structural design II
BCN 2765 - building contracts, codes & specifications
EGN 1120 - engineering graphics

Chipola Junior College

no construction related courses offered

Daytona Beach Community College

BCN 1210 - materials & processes
BCN 1251C - architectural drawing I
BCN 1253C - architectural drawing II
BCN 2257C - structural detailing
BCN 2561 - mechanical & electrical equipment
BCN 2610 - construction estimating
BCN 2614C - construction planning
BCN 2705 - construction management
BCT 0205 - millwork inventory & quality control
BCT 0212 - introduction to woodworking safety
BCT 0213 - introduction to machines: hand tools
BCT 0214 - woodworking safety application
BCT 0216 - woodworking machine applications
BCT 0218 - methods of fastening & machine tools
BCT 0221 - layouts, shapes & angles
BCT 0222 - millwork estimating techniques
BCT 0223 - advanced layout procedures
BCT 0235 - shaper techniques
BCT 0236 - moulder techiques
BCT 0245 - shaper techniques
BCT 0246 - moulder applications

BCT 0248 - cabinet case work
BCT 0247 - stock cutting techniques
BCT 0269 - advanced plastic laminates
ETD 2111C - technical illustration
ETD 2324 - computer aided drafting
ETM 2820 - properties of materials
ETM 2820L - materials testing lab

Edison Community College

BCN 2220 - construction procedures
EGN 1005 - introduction to engineering
ETD 1100 - engineering graphics I
ETD 1220 - engineering graphics II
ETD 1121C - topographical drawing
SUR 1100C - surveying

Florida Keys Community College

no construction related courses offered

Gulf Coast Community College

ARC 1120 - architectural drafting
ARC 2122 - residential architectural design
ARC 2154 - commercial architectural design
BCN 1230 - materials & methods
BCN 1780 - construction computer applications
BCN 2441 - concrete design
BCN 2441L - conrete design lab
BCN 2561 - mechanical & electrical equipment
BCN 2610 - construction estimating
BCN 2712 - construction management
BCN 2742 - contractors license preparation
BCT 1113 - blueprint reading for the building trades
EGN 1141C - computer-aided drafting
ETD 1001 - blueprint reading
SUR 2101 - surveying & measurements

Hillsborough Community College

ARC 1115 - basic drawing in architecture
ARC 1126 - architectural drawing I
ARC 1122C - architectural drawing II
ARC 2036C - architectural design I
ARC 2037C - architectural design II
BCN 1210 - construction materials & processes
BCN 1250 - intro-graphic technology
BCN 1765 - building contracts & specification writing
BCN 2220 - practices & methods of construction I
BCN 2221 - practices & methods of construction II
BCN 2272 - blueprint reading
BCN 2403 - applied statics
BCN 2405C - construction materials testing

BCN 2610C - construction estimating
BCN 2942C - construction laboratory
BCT 1815 - supervisory training for construction foreman
BCT 1816 - building construction contract documents
BCT 2801 - leadership & motivation for superintendents
BCT 2802 - oral & written communication for superintendents
BCT 2803 - problem solving & decision-making
BCT 2805 - planning & scheduling construction projects
BCT 2806 - cost awareness & production control
BCT 2807 - project safety & loss prevention
BCT 2808 - project management for superintendents
BCT 2809 - construction law: changes, claims & negotiations
BCT 2810 - productivity improvement for superintendents
ETM 1650C - air conditioning systems
ETM 1613C - refrigeration principles
SUR 2101C - surveying I

Indian River Community College

ACR 1000 - basic refrigeration
ACR 1100 - basic electricity I
ACR 1300 - basic electricity II
ACR 1741 - components of refrigeration
ACR 2062 - heat & cooling load calculation
ACR 2421 - duct systems
BCN 1210 - materials of construction
BCN 1250C - architectural drafting principles
BCN 2251C - architectural drafting - residential
BCN 2253C - architectural drafting - commercial
BCT 1421 - brick & block construction I
BCT 1422 - brick & block construction II
BCT 1423 - brick & block construction III
BCT 1424 - brick & block construction IV
EGN 1120C - engineering graphics
ETD 1111C - technical drafting I
ETD 1112C - technical drafting II
ETD 1320 - CAD familiarization
HHD 1930 - seminar in interior design I
HHD 1931 - seminar in interior design II
ORH 2851 - landscape design & maintenance

Lake City Community College

no construction related courses offered

Lake-Sumter Community College

EGN 1120C - engineering graphics
EGN 2121C - advanced engineering drawing
EGN 2312 - vector mechanics: statics
ETD 2531C - architectural drafting
ETD 2621C - electronic drafting

Manatee Community College

BCN 1251C - architectural & construction drafting
BCN 2230C - construction materials & methods
BCN 2257C - structural drafting
BCN 2405C - design in building construction
BCN 2610 - building construction estimating
BCN 2742 - contractors examination review
EGN 1120C - engineering drawing
ETC 2210L - soil mechanics
ETC 2450L - concrete
ETC 2500 - highway construction
ETD 1111C - basic detail drafting
ETD 1114C - advanced detail drafting
ETD 1304 - computer aided drafting
ETG 2504 - engineering mechanics-statics
ETG 2530C - strength of materials
ETI 1181 - quality control I
ETI 1182 - quality control II
ETI 1811 - electrical wiring
ETI 1831 - plumbing & pumps
ETI 1835 - structural maintenance
SUR 1100C - surveying I

Miami-Dade Community College

ARC 1126 - architectural drawing I
ARC 1471 - architectural drawing II
ARC 2052 - architectural computer techniques
ARC 2053 - architectural computer applications
ARC 2230 - construction specifications I
ARC 2461 - architectural materials I
ARC 2472 - computer aided drafting
ARC 2580 - architectural structures I
ARC 2582 - architectural structures II
ARC 2681 - environmental technology
BCN 1251 - construction drafting
BCN 1272 - construction plans interpretation I
BCN 1275 - construction plans interpretation II
BCN 1509 - basic plumbing design
BCN 1529 - basic electrical design
BCN 1610 - construction estimating fundamentals
BCN 1616 - construction advanced estimating
BCN 1750 - building construction finance
BCN 1740 - building construction law
BCN 1721 - building construction planning & cost control
BCN 2230 - building construction materials & methods
BCN 2704 - building construction insurance
BCN 2760 - building code regulation
BCN 2712 - building construction supervision
BCN 2925 - building construction seminar
ETC 1225C - materials inspection & testing I
ETC 1250 - construction materials
ETC 1930 - construction & engineering seminar I

ETC 2201 - design and inspection engineering seminar I
ETC 2450 - concrete construction
ETC 2562 - engineering project planning & development
SUR 1001C - construction survey

North Florida Community College

no construction related courses offered

Okaloosa-Walton Junior College

ACR 1000C - principles of hvac
ACR 2060C - hvac
ACR 1300C - electrical theory
ACR 2600C - principles of gas, electrical & solar heating
ACR 2303C - electrical controls
ARC 2307C - environmental control systems
ARC 2121C - architectural drafting
BCN 1230 - materials & processes
BCN 1272 - blueprint reading for commercial construction
BCN 1610 - construction estimating
BCN 1708 - construction documentation
BCN 1529 - electrical systems in construction
BCN 1562 - plumbing & gas construction practices
BCN 2475 - structural systems in construction
BCN 2560 - mechanical systems in construction
BCN 2721 - construction management & planning
HHD 2100 - home planning & furnishings

Palm Beach Junior College

BCN 1210 - building construction materials
BCN 1272 - plans interpretation
BCN 1616 - advanced construction estimating
BCN 1740 - construction law
BCN 1750 - construction finance
BCN 2220 - construction materials & methods
BCN 2253C - architectural drafting
BCN 2712 - construction supervision procedure
BCN 2756 - contracts, specifications, codes & estimates
CAP 1220 - computer drafting
CAP 2230 - advanced computer drafting
EGN 1112 - engineering graphics
ETD 1110C - introduction to technical drawing
ETD 2801C - technical illustration
ETG 2530C - properties & testing of materials
FFP 1203 - fire prevention
FFP 2300 - related fire codes & ordinances
FFP 2320 - building construction for fire protection

Pasco-Hernando Community College

BCN 1220 - structures I
BCN 2610 - construction estimating

BCN 1221 - structures II
BCN 2765 - codes, contracts & specifications
BCN 1520 - electrical systems
BCN 1501 - plumbing systems
BCT 1040 - basic drafting & blueprint reading
BCT 1941 - building construction practicum I
BCT 1942 - building construction practicum II
BCT 2941 - building construction practicum III
BCT 2942 - building construction practicum IV
ETD 1470C - architectural drawing
ETM 2610 - mechanical systems
SUR 2001C - surveying I
SUR 2200C - surveying II

Pensacola Junior College

AHR 0401 - air conditioning I
AHR 0402 - air conditioning lab I
BCN 1001 - building construction
BCN 1251 - drafting fundamentals theory
BCN 1251L - drafting fundamentals lab
BCN 2708 - construction documents
BCN 2610 - construction estimating
BCN 2405C - construction mechanics
BCT 0401 - concrete & masonry theory
BCT 0401L - concrete & masonry lab
BCT 0115 - roofing & siding theory
BCT 0115L - roofing & siding lab
BCT 0117 - interior finishes theory
BCT 0117L - interior finishes lab
BCT 0111 - carpentry theory
BCT 0111L - carpentry lab
BCT 0065 - construction estimating
BCT 0162 - painting theory
BCT 0162L - painting lab
BCT 0501 - plumbing theory
BCT 0501L - plumbing lab
ELE 0101 - basic electricity
ELE 0102 - basic electricity lab
ETC 1250 - properties of materials
ETD 1100C - architectural drafting
SUR 1100 - surveying
SUR 1100L - surveying lab

Polk Community College

BCN 2230 - materials & methods of construction
BCN 2251 - construction working drawings
BCN 2614 - construction management & planning
EGN 1120 - engineering graphics
ETC 2410 - engineering mechanics - statics
ETC 2210 - soil mechanics
ETD 1614 - electronic drafting
ETD 2304 - intermediate engineering graphics

ETD 2354 - advanced engineering graphics
ETG 2530 - structures
FFP 1220 - fire prevention & inspection
FFP 2620 - fire protection & prevention systems
FFP 2310 - fire codes & building construction
SUR 1101 - surveying I
SUR 1140 - surveying II

St. Johns River Community College

no construction related courses offered

St. Petersburg Junior College

ARC 1126C - architectural drawing I
ARC 1271 - professional practice
ARC 1461C - architectural materials & construction
ARC 2122C - architectural drawing II
ARC 2154C - architectural drawing III
BCN 1765 - plans, specifications & codes
BCN 1940 - construction practicum
BCN 1942 - estimating practicum
BCN 2612 - construction estimating II
BCN 2457 - steel, concrete & construction surveying methods
BCN 2568 - plumbing, electrical & hvac systems
FFP 2310 - fire codes & building construction
FFP 2500 - hazardous materials
FFP 2620 - fire protection system
IND 1100 - interior design I
IND 1500 - interior design II
IND 2200 - interior design III

Santa Fe Community College

BCN 1210 - building construction materials
BCN 1220 - construction methods
BCN 1250C - architectural drawing
BCN 1251C - light construction drafting
BCN 1733 - construction safety & codes
BCN 2020 - related specialty trades
BCN 2272 - blueprint reading
BCN 2450 - structural design
BCN 2610 - construction estimating
BCN 2705 - construction management I
BCN 2701 - construction management II
BCT 1132 - construction I
BCT 1134 - construction II
BCT 1151 - construction III
BCT 2411 - skills & techniques of masonry
ETD 1011 - engineering print reading
ETD 1111C - drafting I
ETD 1821C - drafting II
SUR 2001C - construction surveying

Seminole Community College

ACR 0166 - heat pumps
ACR 0170C - basic refrigeration & electricity
ACR 0171C - heating
ACR 0172 - electricity for air conditioning
ACR 0173 - residential air conditioning control systems
BCN 2251 - building construction drafting
BCN 2253 - advanced building construction
CAD 0181 - CAD sprinkler systems
ELC 0167C - electrical wiring residential I
ELC 0168C - electrical wiring residential II
ELC 0169C - introduction to electrical wiring
ETG 2520C - statics & strength of materials
ETI 2100 - elements of quality control
FIR 0304C - fire detection systems
SUR 2100C - surveying

South Florida Community College

VDG 661 - fundamentals of drafting
VDG 663 - pictoral drafting
VDG 664 - architectural drafting

Tallahassee Community College

BCN 2610 - construction estimating & concepts
EGN 1120C - engineering drawing I
EGN 1121C - engineering drawing II
ETG 1520 - engineering mechanics I
ETG 2530 - engineering mechanics II
SUR 2100 - surveying I
SUR 2200C - surveying II

Valencia Community College

ARC 1120C - architectural drawing I
ARC 2122C - architectural drawing II
ARC 2154C - architectural drawing III
ARC 2033C - architectural design
BCN 1200C - building materials & construction methods
BCN 1705 - contracts, codes & specifications
BCN 1721 - construction planning & control
BCN 1220C - heavy construction methods
BCN 2405C - statics & strength of materials
BCN 2021 - advanced construction methods & applications
BCN 2563 - building service systems
ETC 2220C - soils & foundations
ETD 1100C - engineering drawing
ETD 1320 - introduction to CADD
ETD 1350 - advanced CADD

Florida A & M University

BCN 1221C - building construction I
BCN 1222C - building construction II
BCN 2230 - materials & methods of construction I
BCN 2231 - materials & methods of construction II
BCN 2251 - construction documents I
BCN 2253 - construction documents II
BCN 3224 - construction documents III
BCN 3225 - construction documents IV
BCN 3232 - materials & methods of construction III
BCN 3234 - materials & methods of construction IV
BCN 3291 - architectural composition I
BCN 3292 - architectural composition II
BCN 3565C - electricity & lighting
BCN 3566C - plumbing systems
BCN 3700 - construction management I
BCN 3701 - construction management II
BCN 3702 - construction management III
BCN 4511 - heating, ventilation & air conditioning
BCN 4617 - construction estimating I
BCN 4619 - construction estimating II
BCN 4622 - construction estimating III
BCN 4705 - contracts, codes & law
BCN 4725C - site development
BCN 4782 - computer applications in management
ETC 3210 - soil mechanics
ETC 3445 - steel & timber structures
ETC 4450 - reinforced concrete lab
ETC 4216 - site investigations
ETG 2502 - statics
ETG 3530 - strength of materials I
ETI 4671 - engineering economy
ETM 3820 - engineering materials
SUR 3400 - land surveying
SUR 3141 - engineering surveys
SUR 3330 - modern surveying equipment

Florida International University

ARC 1461 - methods & materials of construction I
ARC 2462 - methods & materials of construction II
ARC 3450 - arch. innovation for construction
ARC 4270 - professional office practice
ARC 4335 - site development
BCN 1252 - building construction drawing I
BCN 2256 - building construction drawing II
BCN 3281 - construction surveying
BCN 3240 - construction methods & equipment
BCN 3611 - construction cost estimating
BCN 3720 - construction cost & scheduling
BCN 3762 - codes & specifications
BCN 3703 - management of construction projects
BCN 3640 - economic planning for construction

BCN 3740 - legal aspects of construction & labor
BCN 3402 - mechanics of materials
BCN 3730 - construction safety
BCN 4260 - quality control in construction
BCN 4561 - environmental control in building
BCN 4611 - advanced cost estimating
BCN 5706 - interdisciplinary aspects of housing
BCN 5716 - superintendence of construction
BCN 5755 - construction accounting & finance
BCN 5771 - management & marketing of constuction services
BCN 5784 - construction information services
BCN 6473 - systems approach for housing
BCN 6642 - value engineering in construction
BCN 6785 - computer estimating & cost analysis
ETC 3322C - advanced surveying
ETG 3520L - materials testing
ETG 3530 - strength of materials
ETI 4671 - engineering economy

Florida State University

CES 3100 - structural analysis I
CES 3101 - structural analysis II
CES 4704 - concrete I
ECI 3305C - soil mechanics with lab
ECI 3403 - construction materials
ECI 4147 - construction planning & scheduling
ECI 4149 - construction engineering
ECI 4954 - technical project
EEL 2003 - introduction to electrical engineering
EGN 2331 - strength of materials
EGN 1040 - computer aided graphics
EGN 3613 - principles of engineering economy
SUR 2040C - surveying I with lab

University of Central Florida

CES 4124 - structural engineering analysis
EGN 1111C - engineering graphics
EGN 3210 - engineering analysis & computation
EGN 3311 - engineering analysis-statics
EGN 3363C - structure & properties of materials
EGN 3613 - engineering economic analysis
EGN 3331C - mechanics of materials
EGN 4624 - engineering administration

University of Florida

BCN 1210 - construction materials
BCN 1252 - construction drawing I
BCN 2405 - construction mechanics
BCN 3223 - construction techniques I
BCN 3256 - construction drawing II
BCN 3281 - surveying lab

BCN 3500 - environmental technology I
BCN 3431 - structures I
BCN 3224 - construction techniques II
BCN 3611 - construction estimating I
BCN 4521 - environmental technology II
BCN 3461 - structures II
BCN 4700 - construction management I
BCN 4720 - construction planning & control
BCN 4612 - construction estimating II
BCN 4510 - environmental technology III
BCN 4901L - construction seminar I
BCN 4750 - construction management II
BCN 4709 - construction management III
BCN 4751 - construction entrepreneurship
BCN 4012 - history of construction
BCN 4902L - construction seminar II
BCN 4905 - advanced construction layout
BCN 4464 - temporary structures
BCN 4471 - construction productivity
BCN 4620 - cost estimate analysis
BCN 4713 - construction labor

University of North Florida

BCN 3195 - construction techniques
BCN 3562 - functional systems in buildings
BCN 3610 - construction cost estimating
BCN 3760 - building construction design & codes
BCN 4220 - construction methods
BCN 4561C - mechanical systems in buildings
BCN 4712 - managing building construction
BCN 4752C - site analysis & development
ETG 3115C - engineering calculations
ETI 3721 - safety & health standards
ETI 4643 - production planning & control
ETI 4671 - engineering technology
ETI 4774 - extinguishing & protection systems
SUR 3001C - construction surveying

University of South Florida

CES 3400 - design & practices
CES 4001 - structures I
CES 4700 - cement & concrete design
EIN 4214C - safety engineering
EMA 4324 - corrosion of engineering materials I
EMA 4704 - selection & application of materials
SUR 3140C - engineering land surveying

University of West Florida

BCN 3731 - construction safety
BCN 3257C - construction graphics
BCN 3282C - construction surveying & building layout

BCN 3502 - plumbing & drainage
BCN 3521C - environmental technology - electrical
BCN 3613 - quantity take-off, estimating & bidding
BCN 4431 - structures I - steel & timber
BCN 4461C - structures II - concrete
BCN 4510 - environmental technology - heat & air
BCN 4701 - construction administration
BCN 3012 - history of building
BCN 3211 - materials, methods & equipment
ETI 3452 - equipment & facilities maintenance

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1. An assumption made that all public institutions offer business related courses

APPENDIX K
ACTIVITY DESCRIPTION OF THE ANNUAL CONFERENCE FOR BUILDING OFFICIALS IN FLORIDA

UNIVERSITY OF FLORIDA

37th ANNUAL
Conference For
Building Officials

JANUARY 29 —
FEBRUARY 1, 1989

HOLIDAY INN
SABAL PARK HOTEL
10315 EAST BUFFALO AVENUE
TAMPA, FLORIDA

Sponsored By
Building Officials Association of Florida
School Of Building Construction
and
Division of Continuing Education

37th ANNUAL Conference For Building Officials

Conducted by the
School of Building Construction
University of Florida
Gainesville, Florida

January 29 —
February 1, 1989

School of Building Construction
University of Florida
Gainesville, Florida 32611

Non-Profit
Organization
U.S. Postage
PAID
Gainesville, FL
Permit No. 94

WHY YOU SHOULD ATTEND

The conference is designed to assist building officials and inspectors concerned with regulation of construction in the public interest, administration and enforcement of an adequate building code and maintenance of high standards of community development. An opportunity is provided for exchange of ideas and information on new building materials, new processes of building construction, and administration.

CONFERENCE LOCATION

Holiday Inn Sabal Park Hotel
10315 East Buffalo Avenue
Tampa, Florida 33610
(813) 623-6363

ADVANCE REGISTRATION

Advance registration on the provided form is encouraged. The advance registration fee of $110.00 includes the cost of a luncheon, association hospitality hour, banquet, coffee breaks and materials. Extra luncheon and banquet tickets will be available during registration. Late (desk) registration fee is $120.00.

HOTEL RATES

Room reservations should be made well in advance directly with the hotel using the enclosed reservation card. Special rates for conference attendees are $50.00 per day single/double occupancy. Check In: 2:00 pm. Check Out: 12 noon.

SPOUSE PROGRAM

Spouse registration is $35.00 and will include the President's Reception, Hospitality Hour and Exhibit, the Annual Banquet and daily breakfast, workshops and a tour to Sarasota, Florida.
Spouse registration forms are included in this packet.

CERTIFICATE — CEU'S

A Certificate of Completion and 2.0 Continuing Education Units (C.E.U.) will be awarded only to those who attend all sessions through Wednesday noon. The C.E.U. has been authorized to give recognition to persons continuing their education and keeping up to date in their professional field (C.E.U. proportional to attendance)

ADDITIONAL INFORMATION

Write or Phone:
Dr. Morris Trimmer
School of Building Construction
FAC 101
University of Florida
Gainesville, FL 32611
(904) 392-5863

Registration
37th ANNUAL CONFERENCE FOR BUILDING OFFICIALS
January 29 — February 1, 1989

1. Social Security Number _____ 2. Race _____ 3. Sex ( )M ( )F

4. _____ Date of Birth _____
Last Name First Name Middle Initial

5. Home Phone _____ 6. Office Phone _____ 7. Highest degree ( )Bachelor's ( )Master's ( )Doctorate ( )Professional ( )Other

8. _____
Home Address County City State Zip

9. Occupation _____ 10. Employer _____

11. Office Address _____
County Number or Box City State Zip

This form may be duplicated.
Is this your 1st BOAF Conference?
☐ Yes ☐ No

Return today to: BOAF
Robert Becker, Ex. Sec.
824 Riviera Street
Venice, Florida 33595

ADVANCE REGISTRATION FEE: $110.00
Make Your Check Payable To:
TREASURER, BOAF

37th ANNUAL CONFERENCE FOR BUILDING OFFICIALS
January 29 - February 1, 1989

1989 PROGRAM

Sunday, January 29, 1989

1:00 - 5:00 pm - Registration
1:00 - 3:00 pm - Panel Discussion "Current Legislature"
3:00 - 5:00 pm - "Impact Fees Electing Construction"
3:00 - 5:00 pm - "Fire Rated Materials"
2:00 pm - BOAF Certification Board
2:30 pm - Nominating Committee Meeting
3:00 pm - BOAF Officers and Directors Meeting
6:30 - 8:30 pm - President's Reception

Monday, January 30, 1989

8:30 - 8:45 am - Welcome and Introductions
8:45 - 9:00 am - "State of the Association" BOAF President
9:00 - 9:30 am - Dr. Anthony Calanese Dean of Architecture University of Florida
9:30 - 10:30 am - "Relations Between Building Departments and Florida League of City's, State & County Associations
10:30 - 12:00 pm - Keynote Address "Motivation by Inspiration" Lou Hackler
12:30 - 3:00 pm - BOAF Business Luncheon
3:00 - 4:30 pm - "Changes to the Law - DPR"
4:30 - 5:30 pm - "Unlicensed Contractors" Dr. Morris Trimmer
6:30 - 8:00 pm - "Get Together Between Industry & Code Enforcement"

Tuesday, January 31, 1989

8:30 - 11:00 am - "Doom to Comply" Joe Belcher
11:00 - 12:00 am - "Doom to Comply"
S.B.C.C.I.
8:30 - 10:00 am - "Codes & Standards"
10:00 - 11:00 am - "The Law & the Building Official"
11:00 - 12:00 pm - "F.A.M.U. Report"
12:00 - 1:00 pm - Lunch
1:00 - 3:00 pm - "Radon" Professor Richard Furman & Panel
3:00 - 4:00 pm - "Future Responsibility of the I.R.S."
3:00 - 5:00 pm - "Affordable Housing" Professor Richard Furman
4:00 - 5:00 pm - "Fire Research Lab" Dr. Wei-lin Chang
6:30 pm - Social Hour (Cash Bar)
7:30 pm - Banquet

Wednesday, February 1, 1989

8:30 - 10:00 am - "Florida Economic Outlook" Dr. Henry Fishkind
10:00 - 12:00 pm - "Pre-stressed & Post-tension" Florida Pre-Stressed Concrete Association
12:00 pm - Adjournment

APPENDIX L
PROPOSAL FOR ANNUAL CONFERENCE OF FLORIDA LICENSED CONTRACTORS

It is generally believed that the best way to start a continuing education program is to organize an annual conference to bring social function into continuing education programs. The Florida State Building Construction Industry Advisory Committee has successfully sponsored the Annual Conference of Building Officials Association of Florida for several years which could be used as a model for organizing an annual conference for contractors in Florida. An annual conference will attract a large number of voluntary attendees. The conference can be expanded in later years to service up to 1,000 people, at which time it would be best to hold regional conferences in South and North Florida separately one in the spring and one in the autumn respectively. The School of Building Construction and the Division of Continuing Education would be the ideal coordinator and organizer for this conference.

The program of the conference might include such topics as management, code, licensing, regulation, zoning for general sessions and techniques with special code requirements for separated trade group sessions.

ANNUAL CONFERENCE OF FLORIDA LICENSED CONTRACTORS

Budget

FEES

Registration - $200.00
Projected number of registrants: 300

Exhibitors - $300.00
Projected number of exhibitors: 30

INCOME

Total Registration Fees	- $60,000.00
Total Exhibition Fees	- $9,000.00
Other Income (BCIAC Grant)	- $10,000.00
Total Income	- $79,000.00

EXPENDITURES

Speakers	$10,000.00
Printing, telephone, mailing, xerox	7,000.00
Travel	6,000.00
Educational materials	6,000.00
Food	20,000.00
Advertising	1,500.00
Other	2,500.00
CEO Fee	1,000.00
Organization and administration (30%)	23,700.00
Total Program Cost	$77,700.00

NET DIFFERENCE $1,300.00

PROGRAM

First Day (Thursday)

10:00 a.m. -	Noon	Registration Exhibition set up
Noon -	1:00 p.m.	Lunch on your own (Board lunch)
1:00 p.m. -	2:00 p.m.	Keynote speech
1:00 p.m. -	5:00 p.m.	Exhibits open
2:00 p.m. -	3:15 p.m.	General session (Management)
3:15 p.m. -	3:30 p.m.	Coffee break
3:30 p.m. -	5:00 p.m.	General session (Management)

Second Day (Friday)

9:00 a.m. -	5:00 p.m.	Exhibits open
8:00 a.m. -	10.00 a.m.	General session (Zoning, regulations)
10:00 a.m. -	10:15 a.m.	Coffee break
10:15 a.m. -	Noon	General session (Code)
Noon -	1:30 p.m.	Lunch on your own
1:30 p.m. -	3:00 p.m.	General session (Licensing)
3:00 p.m. -	3:15 p.m.	Coffee break
3:15 p.m. -	5:00 p.m.	Break up in trade groups (techniques)
6:30 p.m. -	7:30 p.m.	Reception
7:30 p.m. -	10:00 p.m.	Banquet

Third Day (Saturday)

9:00 a.m. -	Noon	Exhibits open
8:00 a.m. -	10:00 a.m.	Break up in trade groups (techniques)
10:00 a.m. -	10:15 a.m.	Coffee break
10:15 a.m. -	Noon	General session (Review and discussion)
Noon		Lunch Conference adjourns Exhibits close

APPENDIX M
UNIVERSITY OF FLORIDA DIVISION OF
CONTINUING EDUCATION CONFERENCE EVALUATION FORM

In order to assist us in planning future conferences, the conference staff would like to know your assessment of this meeting. Please complete this form at the end of the conference and return it to the registration desk. Thank you for your assistance.

Title_____Type of organization_____

Have you previously attended conferences on this or closely related subjects?

_____Yes _____No

Would you attend a conference on this subject again? _____Yes _____No If not, explain:

_____

_____

In terms of content expectations, I would say this conference: (circle letter)

A. met all of my expectations. I was satisfied.

B. met most of my expectations.

C. met some of my expectations.

D. met so few of my expectations that I was disappointed.

Which sessions were of most value to you? _____

_____

_____

What areas do you feel could have received more auention? _____

_____

_____

_____

Was the format of the conference (some lecture, some discussion, some audiovisual) comfortable for you?

_____Yes _____No If not, how would you improve it?_____

_____

Disregarding the content of the sessions, I would say this conference was:

A. extremely-well organized and planned.

B. well organized and planned with only a few difficulties.

C. not well organized, with several problems.

D. very poorly organized and planned.

How did you learn of this conference?_____

Did you hear of it through any other sources? If so, state: _____

_____

Was pre-conference publicity adequate?

_____Yes _____No If no, please suggest ways it might have been improved: _____

_____

Did you sign up for professional continuing education recognition?

_____Yes _____No Are there other types you feel should have been offered? Please list: _____

_____

Did you have any major problems finding your room, the sessions, or other areas at the conference location?

_____Yes _____No If yes, please comment: _____

_____

What other continuing education programs in related areas would you like to attend?_____

_____

Additional comments: _____

_____

_____

_____

_____

_____

APPENDIX N
AGREEMENT BETWEEN THE UNIVERSITY OF FLORIDA DIVISION OF CONTINUING EDUCATION AND A COLLEGE OF THE UNIVERSITY OF FLORIDA FOR SERVICES PROVIDED FOR A UNIVERSITY OF FLORIDA PROGRAM OR CONFERENCE

Provision of Services

The University of Florida Division of Continuing Education (DOCE) agrees to provide professional services to the College to include assistance with Continuing Education program planning, promotion, implementation and/or fiscal management. These services are listed below in more specific detail.

Administration of Participant Fee Income

DOCE will collect and disburse under the appropriate statutes of the State of Florida and the Rules and Regulations of the University of Florida and the State University System Board of Regents, fees paid for participants to attend the program. DOCE will expend these revenues in accordance with the approved budget. In return for the professional services provided, DOCE will retain an amount equal to a percent of the collected fees, as described below.

Should the total revenue from participant fees exceed the total expenditures for the conference, including the DOCE fee-for-service, DOCE agrees to place these funds in a special account designated for the use of the College as outlined in the Policies and Procedures of Continuing Education approved by President Criser, August 1987.

Should the total revenue fall short of program expenditures, the College agrees to reimburse DOCE for the difference between authorized expenditures (including DOCE fee) and program income. DOCE will provide appropriate invoices for any reimbursements so required.

Limited Responsibility

DOCE assumes the responsibility for only the services listed in this agreement. All other tasks, obligations and responsibilities for the conference are the responsibility of the College.

DOCE PROFESSIONAL SERVICES

OPTION A

DOCE will:

I. Initial Structural Arrangements

A. Participate in planning meetings at the College's request.
B. Decide in writing who will be responsible for each conference task, and how the members of the planning group will report their progress.

II. Program Planning

A. Review program plans with the faculty, and advise the faculty on program needs, such as a realistic timeline, promotion or marketing plan, site selection, source of income, or personnel needs.
B. Present the College with a written list or letter of agreement detailing the services recommended by DOCE for this particular program.
C. Develop and present to the College proposed program budgets, and revise budgets as necessary to achieve an approved budget signed by the College Dean.

III. Program Promotion

A. Assist in development of a comprehensive plan and timeline.
B. Help identify potential participants and the number of individuals in each identified target population.
C. Assist in the preparation and placement or distribution of news articles or advertisements.
D. Advise the College staff in the design and preparation of promotional materials.
E. Coordinate production and distribution of promotional materials such as brochures.
F. Process requisitions and invoices to pay for all promotional materials.

IV. Program Implementation

A. Provide full fiscal management with complete accountability, regular reports, payment of all bills, preparation and processing of all fiscal paperwork and/or contracts including any overload and OPS in a timely manner.
B. Process both on-site registration and pre-registration with official receipting and letters of confirmation. This will include any correspondence relative to registration or registration changes and training of any extra on-site registration personnel needed.
C. Assist with site selection and food service and contracts for the event.
D. Provide on-site program management.
E. Help the College establish an enrollment-driven management and cancellation policy.
F. Produce nametags, tickets or certificates of attendance, if requested.
G. Generate regular or on-request registration reports, including a registration list.
H. Monitor the budget, reporting and revising as requested by the College.
I. Process contracts, correspondence and logistical needs of invited speakers.
J. Initiate and process all encumbrances and payments, as requested by the College.
K. Correspond with vendors as needed.
L. Assist the College staff in completing a final evaluation of the program.
M. Assist the College staff in writing appropriate letters of appreciation.
N. Execute all steps to meet all final obligations incurred by the program such as distribution of some materials developed; collection of necessary travel receipts or possibly signed contracts of completion, as required for payment.
O. Maintain historical files for audit purposes or future reference.
P. Arrange a meeting to consider subsequent programs.

The fee for administrative services in OPTION A is minimum of 20% of the gross revenue.

OPTION B

DOCE will:

I. Initial Structural Arrangements

A. Participate in planning meetings at the College's request.
B. Decide in writing who will be responsible for each conference task, and how the members of the planning group will report their progress.

II. Program Planning

A. Review program plans with the faculty, and advise the faculty on program needs, such as a realistic timeline, promotion or marketing plan, site selection, source of income, or personnel needs.
B. Present the College with a written list or letter of agreement detailing the services recommended by DOCE for this particular program.
C. Develop and present to the College proposed program budgets, and revise budgets as necessary to achieve an approved budget signed by the College Dean.

III. Program Promotion

A. Assist in development of a comprehensive plan and timeline.
B. Help identify potential participants and the number of individuals in each identified target population.
C. Assist in the preparation and placement or distribution of news articles or advertisements.
D. Advise the College staff in the design and preparation of promotional materials.
E. Coordinate production and distribution of promotional materials such as brochures.
F. Process requisitions and invoices to pay for all promotional materials.

IV. Program Implementation

A. Provide basic accounting. All transactions, <u>except</u> those so marked on the attached budget, are initiated in the College. The College staff is responsible for preparing all paperwork in conformity with Finance & Accounting regulations. All paperwork must be approved by DOCE before being forwarded to Finance & Accounting.
B. Assist with planning and coordination of selected items of the budget.
C. Receipt funds. This would be handled completely by DOCE <u>except</u> on-site.
D. Receipt PRE-registration only, with letters of confirmation to be sent with receipts.
E. Prepare and process all deposits.
F. Generate reports regularly, to include a list of registrants.
G. Provide appropriate training (approximately one or two hours) for the College staff, to cover basic procedures and audit requirements.
H. Monitor the program budget only to the extent required to prevent unreimbursable (to DOCE) expenditure.

The fee for administrative services in OPTION B is 15% of the gross revenue.

OPTION C.

DOCE will:

I. Initial Structural Arrangements

A. Participate in planning meetings at the College's request.
B. Decide in writing who will be responsible for each conference task, and how the members of the planning group will report their progress.

II. Program Planning

A. Review program plans with the faculty, and advise the faculty on program needs, such as a realistic timeline, promotion or marketing plan, site selection, source of income, or personnel needs.
B. Present the College with a written list or letter of agreement detailing the services recommended by DOCE for this particular program.
C. Develop and present to the College proposed program budgets, and revise budgets as necessary to achieve an approved budget signed by the College Dean.

III. Program Promotion- No DOCE involvement

IV. Program Implementation

A. Provide basic accounting only. All transactions are initiated in the College. It is the responsibility of the College staff to prepare all paperwork in a timely manner, ready to be sent to the Office of Finance and Accounting after it is approved by DOCE. Receipt of funds will be handled by the College staff in accordance with SUS regulations and deposited with a copy of the deposit sent to DOCE.
B. Provide complete training and ongoing consultation for the College. This will include coordinator training.
C. Monitor the program budget only to the extent required to prevent unreimbursable (to DOCE) expenditure.

The fee for administrative services in OPTION C is 10% of the gross revenue.

OPTION D.

DOCE will:

I. Initial Structural Arrangements

A. Participate in planning meetings at the College's request.
B. Decide in writing who will be responsible for each conference task, and how the members of the planning group will report their progress.

II. Program Planning

A. Review program plans with the faculty, and advise the faculty on program needs, such as a realistic timeline, promotion or marketing plan, site selection, source of income, or personnel needs.
B. Present the College with a written list or letter of agreement detailing the services recommended by DOCE for this particular program.

III. Program Promotion- No DOCE involvement

IV. Program Implementation

A. Provide basic accounting only. All transactions are initiated in the College. It is the responsibility of the College staff to prepare all paperwork in a timely manner, ready to be sent to the Office of Finance and Accounting after it is approved by DOCE. Receipt of funds will be handled by the College staff in accordance with SUS regulations and deposited with a copy of the deposit sent to DOCE.
B. Provide appropriate training (approximately one or two hours) for the College staff, to cover basic procedures and audit requirements.
C. Monitor the program budget only to the extent required to prevent unreimbursable (to DOCE) expenditure.

The fee for administrative services in OPTION D is 5% of the gross revenue:

Additional Services

In addition to the services listed above, DOCE agrees to provide any services which are necessary to the successful and satisfactory execution of the program provided such services can be undertaken without undue expenditure of funds and with available personnel.

DOCE recognizes that the College staff has the primary responsibility for the quality of the program, and pledges maximum cooperation with the College staff and its personnel in an effort to make this program reflect positively on the College and the University of Florida.

Suspension of Services

In the event the College wants DOCE to suspend services under this Agreement, the College will notify DOCE in writing at least one week in advance of the suspension date. When the College wants DOCE to resume services, it will again notify DOCE in writing at least one week in advance. After three months, suspension will be understood as termination, and DOCE will close out the program. In that case, the DOCE fee will be figured on percentage of tasks completed, as follows:

I. Structural Arrangements	10%
II. Program Planning	10%
III. Program Marketing and Promotion	30%
IV. Program Implementation	50%

(Note: percentages may vary with different programs.)

All of the sub-tasks under each of the above would be proportioned to total 100% of the appropriate main task.

The College will also reimburse DOCE for any expenditures made in providing the agreed services and any penalties imposed, deposits lost, or other expenses incurred in the cancellation of vendor contracts/purchase orders.

APPENDIX O
SAMPLE COMPETENCE-BASED PROFESSIONAL DEVELOPMENT SEMINAR

A Professional Development Seminar for General Contractors

Determining Risk and Bid Desirability
in Construction Contracts and Specifications

SESSION 1
METHODS OF CONTRACTING

SKILL:
1. To comprehend the difference between formal advertising and negotiation and be able to recognize the circumstances that determine the appropriate use of each.
2. To prepare formal advertisements and to respond effectively to requirements within advertisement when submitting bid.
3. To master negotiating techniques in construction settings.
4. To assess the impact of contracts on preparing estimates and schedules, and overall business risk management.

FORMAT: Formal lecture, guided hands-on application in case studies, group discussion

I. FORMAL ADVERTISING

A. Conditions for use

B. Preparation of the invitation for bids (IFB)

C. Publicizing the IFB

D. Submission of bids by prospective contractors

E. Awarding of the contract

1. Responsive bid - external

2. Responsible bidder - internal

II. TWO-STEP FORMAL ADVERTISING

A. Step one — Request for technical proposal

B. Step two — formally advertised acquisition

III. NEGOTIATION

A. Conditions favorable for negotiation

B. Price negotiation policies and techniques

C. Preparation for negotiation

D. Negotiation skills practice

E. Negotiation after advertising

SESSION 2
INTRODUCTION TO CONTRACT AND CONSTRUCTION LAW

SKILL:

1. To know the essential elements and principles of contract formation as they apply to construction law.
2. To comprehend the rules that the boards and courts use to interpret contract language.
3. To recognize areas of potential dispute in construction contracts and clauses.
4. To determine the effect rules will have on business risk, contractual liability, obtaining and evaluating bids, and preparing cost estimates.
5. To form and prepare contracts, subcontracts, change orders, and agreements.

FORMAT: Formal lecture, guided hands-on application, group discussion

I. ELEMENTS OF A CONTRACT

A. Offer

B. Acceptance

C. Competent parties

D. Valid consideration

E. Lawful purpose

F. Clearly stated terms

II. HOW TO READ A CONSTRUCTION CONTRACT

A. Rules of interpretation

1. The contract will be read as a whole
2. Negotiations may be examined to explain but not to enlarge the contract
3. The contract language is presumed to express the intent of the parties
4. Objective meaning of works is preferred over subjective
5. Ordinary meaning is preferred over technical
6. Technical meaning controls in technical context
7. A lawful result is preferred over unlawful
8. A practical result is preferred over an absurd literal interpretation
9. Specific terms control over general terms
10. Typewritten controls over printed matter
11. Handwritten controls over typewritten matter
12. Specifications control over drawings if in conflict
13. Specifications and drawings are read together
14. Performance specifications control
15. Design specifications are warranted as correct
16. Trade practice governs contract performance, but
17. Plain contract language overrides trade usage
18. Contractor's interpretation, if reasonable, controls
19. Ambiguous language will be construed against the drafter

B. Disputes in contracts

1. Resolving
2. Avoiding

SESSION 3
INTERNAL STRUCTURE OF THE CONTRACT

SKILL:

1. To know the characteristics and applicability of the common forms of contracts and to recognize one's performance requirements.
2. To understand various factors that should be considered in structuring the contract.
3. To understand and apply the influences of the various methods of compensation on cash flow management principles.

FORMAT: Formal lecture, case studies, guided hands-on application

I. OVERVIEW OF POSSIBLE METHODS OF CATEGORIZING CONTRACTS

A. End Purpose

B. Methods of Compensation

C. Conditions of Delivery

II. FACTORS THAT INFLUENCE THE TYPE OF CONSTRUCTION CONTRACTS

A. Contract law

B. Knowledge of requirements

C. Risk

D. Surveillance capability

E. Fund availability

F. Time constraints

G. Contract output

III. END PURPOSE

A. Construction

Construction, alteration or repair of buildings, structures or other real property

B. Service

A service contract means a contract that directly engages the time and effort of a contractor whose primary purpose is to perform an identifiable task rather than to furnish an end item of supply.

1. Personal and Nonpersonal Services

   a. Personal services contract — the contractor personnel appear, in effect, employees of the organization

   b. Nonpersonal services contract — the personnel rendering the services are not subject to the supervision and control prevailing in relationships between the organization and its employees.

2. Some of the areas in which service contracts are found:

   a. Maintenance, overhaul, repair, servicing, rehabilitation, salvage and modernization or modification of supplies, systems and equipment

   b. Routine recurring maintenance of real property

   c. Janitorial services

   d. Management consulting services

   e. Engineering, architecture and technical services

   f. Operation of owned equipment, facilities, and systems

   h. Transportation and related services

IV. METHOD OF COMPENSATION

A. Fixed price

1. Firm fixed price

   a. Lump sum (total work or defined parts)

   b. Unit price (specified quantity of work units)

2. Fixed price with economic price adjustment

   a. Established prices

   b. Actual costs

   c. Cost indexes

3. Fixed price incentive firm

   a. Cost

   b. Performance

   c. Delivery

B. Cost reimbursement

1. Cost plus incentive fee

2. Cost plus award fee

a. Base amount

b. Judgmental evaluation

3. Cost plus fixed fee

4. Cost plus percentage of cost

C. Time and materials/labor hour

1. Direct labor hours at specified fixed hourly rates

2. Material at cost

V. BY CONDITIONS OF DELIVERY

A. Definite delivery

1. Known quantity

2. Know delivery/performance time

B. Indefinite delivery

1. Definite quantity

a. Known quantity

b. Unknown time

2. Indefinite quantity

a. Min/max quantity known

b. Unknown time

3. Requirements

a. Best estimate of quantity

b. Unknown time

SESSION 4
ELEMENTS OF A PROJECT MANUAL

SKILL:
1. To know the elements within the project manual, their purpose, and their role in the execution of the contract.
2. To know how specifications should be organized according to the CSI Master-format.

FORMAT: Formal lecture, group discussion, guided hands-on application

I. BACKGROUND AND INTRODUCTION TO CONTRACT DOCUMENTS

II. PRINCIPLES

A. Clarify purpose of specifications

B. Standardization and flexibility

C. Uniformity in finding material

D. Consistency

E. Communication device

III. THE UNIFORM SYSTEM — The Project Manual concept

A. Bidding requirements

B. Contract documents and forms

1. Divisions 1-16

a. General conditions

b. Supplementary conditions

c. Technical provisions

2. Drawings

a. Extent, size, and shape

b. Generic types of materials

c. Relationship of materials

C. Amendments & change orders

IV. DIVISION I — GENERAL REQUIREMENTS

A. Division 1 defines the scope of the contract on which bidding requirements and contract forms are based.

B. Division I documents

1. Summary of Work
2. Allowances
3. Measurement and Payment
4. Alternates
5. Coordination
6. Field Engineering
7. Regulatory Requirements
8. Abbreviations and Symbols
9. Identification Systems
10. Reference Standards
11. Special Project Procedures
12. Project Meetings
13. Submittals
14. Quality Control
15. Construction Facilities and Temporary Controls
16. Materials and Equipment
17. Starting of Systems
18. Contract Closeout
19. Maintenance

V. DIVISION 2 THROUGH 16 — TECHNICAL SECTIONS

A. Criteria for separating technical divisions

1. Assist contractor
2. Assist construction management

B. The 16 Divisions — CSI Masterformat

1. General Requirements
2. Site Work
3. Concrete
4. Masonry
5. Metals
6. Wood and Plastics
7. Thermal and Moisture Protection
8. Doors and Windows
9. Finishes
10. Specialties
11. Equipment
12. Furnishings
13. Special Construction
14. Conveying Systems
15. Mechanical
16. Electrical

C. Typical technical section layout

1. General
    a. Work included
    b. Related work
    c. Description
    d. Quality assurance
    e. References
    f. Submittals
    g. Delivery, storage, and handling
    h. Project site/conditions

i. Alternatives

j. Warranty

2. Products

a. Materials

b. Equipment

c. Mixes

d. Fabrication

3. Execution

a. Inspection

b. Preparation

c. Installation/application/erection

d. Field quality control

e. Adjust and clean

f. Schedules

VI. RELATIONSHIP BETWEEN GROUPINGS

A. Concept of general

1. Direct general information to who will need it

2. Place general information where it will be consistent with the specification organization

3. Place general information where it will be used

B. Levels of general information

1. General provisions

2. Division 1

3. Broadscope sections

4. Narrowscope sections

SESSION 5
CLAUSES AND CONTRACT DOCUMENTS

SKILL:

1. To comprehend the provisions of construction contract clauses that relate to the preparation of plans and specifications.
2. To reduce conflicts among the clauses and between the clauses and the specifications.
3. Use of existing documents to combat improper and poor communication within the contract.

FORMAT: Formal lecture, group discussion, guided hands-on application

I. OVERVIEW OF STANDARD DOCUMENTS

A. Standard General Conditions of the Construction Contract (EJCDC 1910-8)

B. Contract Documents for Construction of Federally Assisted Water and Sewer Projects

C. Standard Form of Agreement Between Owner and Contractor on the Basis of a Stipulated Price (EJCDC 1910-8-A-1)

D. Standard Form of Agreement Between Owner and Contractor on the Basis of Cost-P[us (EJCDC 1910-8-A-2)

E. Change Order (EJCDC 1910-8-B)

F. Certificate of Substantial Completion (EJCDC 1910-8-B)

G. Application for Payment (EJCDC 1910-8-E)

H. Work Directive Change (EJCDC 1910-8-F)

I. Guide to the Preparation of Supplementary Conditions (EJCDC 1910-17)

J. Suggested Bid Form and Commentary for Use (EJCDC 1910-18)

K. Engineer's Letter to Owner Requesting Instructions re: Bonds and Insurance During Construction (EJCDC 1910-20)

L. Owner's Instructions to Engineer re: Bonds and Insurance During Construction (EJCDC 1910-21)

M. Notice of Award (EJCDC 1910-22)

N. Notice to Proceed (EJCDC 1910-23)

O. EPA Standard Proposal Form

P. Standard Form of Agreement Between Owner and Contractor (AIA AIOI)

Q. General Conditions of the Contract for Construction (AIA A201)

R. Abbreviated Form of Agreement Between Owner and Contractor (AIA A107)

S. Standard Form of Agreement Between Owner and Contractor — Cost Plus Fee (AIA 111)

T. Abbreviated Form of Agreement Between Owner and Contractor (AIA A117)

U. Contractor's Qualification Statement (AIA A305)

V. Guide to Supplemental Conditions (AIA A511)

W. Change Order (AIA G701)

X. Application and Certificate for Payment and Continuation Sheet (AIA G702 & G703)

Y. Certificate of Substantial Completion (AIA G704)

Z. Preliminary Design-Build Agreement (AGC 400)

AA. Standard Form of Design-Build Agreement and General Conditions Between Owner and Contractor (AGC 410)

BB. Standard Form of Design-Build Agreement and General Conditions Between Owner and Contractor (Where the basis of compensation is a lump sum) (AGC 415)

CC. Standard Form of Agreement Between Contractor and Architect (AGC 420)

DD. Conditions Between Contractor and Subcontractor for Design-Build (AGC 430)

EE. Change Order/Contractor Fee Adjustment (AGC 440)

FF. Standard Design-Build Subcontract Agreement with Subcontractor not Providing Design (AGC 450)

GG. Standard Design-Build Subcontract AgreeMent with Subcontractor Providing Design (AGC 450-1)

HH. Standard Form of Agreement Between Owner and Construction Manager (AGC 500)

II. Amendment to Owner-Construction Manager Contract (AGC 501)

JJ. Standard Form of Agreement Between Owner and Construction Manager (Owner Awards all Trade Contracts) (AGC 510)

KK. General Conditions for Trade Contractors and/or Construction Management Agreements (AGC 520)

LL. Change Order/Construction Manager Fee Adjustment (AGC 525)

MM. Standard Subcontract Agreement for Building Construction (AGC 600)

NN. Short Form Subcontract (AGC 603)

OO. Standard Sub-bid Proposal (AGC 605)

PP. Subcontract Performance Bond (AGC 606)

QQ. Subcontract Payment Bond (AGC 607)

RR. Subcontractor's Application for Payment (AGC 610)

SS. AGC Certificate of Substantial Completion (AGC 625)

TT. Standard Form of Negotiated Agreement Between Owner and Contractor (AGC 645)

UU. AGC Equipment Rental Agreement (AGC 907)

II. MODIFICATION AND INTEGRATION OF STANDARD DOCUMENTS

A. Successful management of construction documents

B. Construction contract disputes

C. Preventing construction claims

D. Controlling out-house legal costs

III. SAMPLE CONTRACTUAL CLAIMS

A. Discrepancy or ambiguity in drawings or documents comprising the contract documents

B. Failure to supply drawings or details

C. Specification of alternatives

D. Disruption of progress

E. Tests for specification compliance

F. Use of reference standards in specifications

G. Harsh contract language

H. Causation or chain of causation

I. Emergency work

J. Opening up for inspection of work found to be in accordance with the contract documents

K. Making good defects due to inclement weather

L. Errors or omissions in the Project Manual

M. Frustration or impossible execution of the contract

N. Documents purporting to impose obligations beyond the contract documents

O. Protection of existing work

P. Unreasonable instructions

Q. Specifying methods

R. Field and subsurface conditions

S. Review of shop drawings, product data and samples

T. Communication facilitating or hindering contract administration

U. Concealed or unknown conditions

V. Partial occupancy

W. Safety of persons and property

X. Work covered contrary to contract documents

Y. Work resulting from additional testing, inspection, or approval not originally included in contract documents

SESSION 6
METHODS OF SPECIFYING

SKILL:

1. To understand the four basic methods of specification writing, that each method has specific uses and limitations, and that each method requires a different approach to enforcement.

2. To prepare a bid, manage, and conduct operations under all or combined methods.

3. To understand writing techniques which make specifications easier to read, understand and enforce.

FORMAT: Formal lecture, case studies, guided hands-on application

I. RATIONALE WHY DIFFERING METHODS OF SPECIFYING ARE CHOSEN

A. What method will best describe the required item or produce the required results?

B. What degree of control must be retained over product selection?

C. How will the choice of method affect the final cost?

II. METHODS OF SPECIFYING

A. Prescriptive — Describes the means to meet an unstated end

1. Proprietary

2. Reference

3. Descriptive

B. Performance — Describes the end, not concerned with the means

III. PROPRIETARY SPECIFICATIONS

Identifies the desired product by manufacturer, brand name, model or type designation, or important characteristics

A. Characteristics

1. Acceptable product identified

2. Identification includes detailed product information

3. Substitution restricted or not permitted

B. Advantages/disadvantages

1. Advantages

a. Rigid control over product selection

b. Shortens specification development effort

c. Quality clearly established

2. Disadvantages

a. Eliminates competition which may increase price

b. Favors certain products/manufacturers over others

c. Difficulty in evaluating equality

C. Types of proprietary specifications

1. Substitution prohibited (closed spec)

a. Base bid

One product specified which forms the basis for bid proposal

(1) Advantages

Establishes quality, function and performance of each item

Rigid control over product

Design can be completed to smallest detail

Promotes more accurate bidding

(2) Disadvantages

May incur high costs due to single supplier

Contractor may be forced to use product he does not like

Open to claims of collusion

b. Modified base bid

Specifies several acceptable products from which bidders may make a selection.

(1) Advantages

Increases competition

Product control

Allows contractor selection

(2) Disadvantages

Specifier must ensure named products are equal

Restricts detailed design

c. Base bid with requested alternates

One product named which forms the basis for the bid; however, bids on predetermined, acceptable alternates are also requested.

(1) Advantages

Alleviate problem with extravagant costs

Contractor can quote a price of a product he prefers rather than just base bid product

(2) Disadvantages

Possibility of collusion claims

Specifier must evaluate alternates

2. Substitution permitted (open spec)

a. Base bid with alternate and substitutions

One product named which forms the basis for bid; however, bidder is permitted to submit requests for substitution, highlighting the cost difference that would result if the substitute/ alternate bid is accepted.

(1) Advantage

Increases competition

(2) Disadvantages

Prolongs evaluation to determine low bidder

Possibility of obtaining inferior products

b. Or approved equal

Names a specific product but indicates the option of meeting the requirements of the specified items with similar products termed "equal" by stating "or approved equal" after specified product.

(1) Advantage

Increases competition

(2) Disadvantages

Loss of product selection control

Greater possibility of obtaining inferior products through substitution

Must decide who determines equality

c. Modified or approved equal

Names a specific product indicating the option of meeting the specified item with similar products termed "equal"; however, the critical characteristics of the specified materials are stated in addition to the brand name. The substitution must meet these characteristics with little, if any, change.

(1) Advantages

Allows some competition

Provides specifier with more product control than "or approved equal"

(2) Disadvantages

Possibility of specification becoming overly restrictive by specifying characteristics associated with only one product

Possibility of obtaining inferior products through substitution

E. Enforcement

1. Substitution prohibited

Item used must be identical to brand(s) and model(s) specified.

2. Substitution permitted

Complex comparison of contractor's selected product with that specified may cause disagreements on question of equality. To overcome:

(1) State requirements and procedures under which substitutions will be considered

(2) State that substitutions must be submitted in writing before close-of-bid period

F. Examples

1. Grating to be Irving Aluminum Plank extruded from aluminum alloy 6063-T6 manufactured by IKG Industries.,Plank size shall be depth 1 1/2" with a width not to exceed 3'-0" and a span not to exceed 6'-0".

2. Furnish and install a 3/4" backflow preventer, Watts Series 900, to heating water system as indicated on the drawings.

IV. REFERENCE SPECIFICATIONS

Specify products, product characteristics, or methods by reference to an accepted industry standard.

A. Characteristics

1. Recognized as an authority

2. Readily available to all

3. Specified by edition

4. Establishes minimum acceptable quality

B. Advantages/disadvantages

1. Advantages

a. Standards widely known and accepted

b. Reduces development effort

c. Uses expertise of authorities on the subject

2. Disadvantages

a. Availability and currency of standard

b. Ambiguities sometimes exist within standards

c. Standards refer to minimum requirements which could result in lower quality products

d. Sometimes slanted to protect group publishing standard

e. Could cause confusion if date not specified

C. Enforcement

1. Specifier must know the standard

2. Incorporate the standard properly

3. Enforce the requirements of the standard

a. Make available to both contract inspector and contractor

b. Contract inspector must be capable of interpreting the standard correctly and have the ability and means to test for compliance

c. Contractor must understand requirements of standard will be tested for compliance

D. Examples

1. Gateposts shall be steel pipe, galvanized in accordance with ASTM A 120-79. Post sizes shall be as indicated.

2. Cross-linked polyethylene insulation for cables shall be an extruded single wall of heat-stabilized and light-stabilized, filled or unfilled, chemically cross-linked polyethylene conforming to ICEA S-66-524 and ASTM D 574-79 for ozone-resistance.

V. DESCRIPTIVE SPECIFICATIONS

A detailed written presentation of required properties of a product, material or piece of equipment and the workmanship required to fabricate, erect or install. In other words, describe in detail what is desired and how to make it operational.

A. Characteristics

1. Written description of what is desired

2. Written description of how to fabricate/install

3. Requires product or installation expertise

4. Can be met by current products on the market

5. Provides information on submittals and testing

B. Advantages/disadvantages

1. Advantages

a. States exactly what is desired

b. Applicable to any subject

c. Encourages competition

d. Best suited for complex or complicated components or systems that cannot be shown adequately on drawings

2. Disadvantages

a. Results in long specification

b. Time consuming to write

c. Requires expertise of product and/or method

d. May be impossible to find a product that meets all requirements

C. Enforcement

1. Describe critical features that must be met

2. Ensure these features can be met by acceptable, available products

3. Provide information on required submittals, testing, and other procedures necessary to assure the desired result is obtained

D. Examples

1. Aluminum plank grating is to be 1 1/2" deep, made from 6" wide sections. Plank grating is to sustain a uniform load of 180 PSF on a 6'-0" span and deflect 0.700 inches. Top surface shall be provided with 3" by 19/32" rectangular openings and have continuous raised longitudinal ridges for skid resistance. In addition, the connecting webs between punchouts shall each have two raised ribs oriented perpendicular to the longitudinal ridge for additional transverse stiffness and skid resistance. Material shall be provided with a mill finish. Overall dimensions and span directions IAW plans.

2. Gravity dampers shall be factory fabricated, parallel-blade type with delicately balanced blades that open automatically when the fan starts and close by gravity when the fan stops. The blades shall be constructed of galvanized steel or aluminum sheets with interlocking edges, with a maximum width of 10 inches. The edges of the blades shall be provided with felt on rubber strips to prevent rattling. Damper blades shall be supported on galvanized steel or aluminum frames.

VI. PERFORMANCE SPECIFICATIONS

A statement of required results, verifiable as meeting stipulated criteria, and free of unnecessary process limitations.

A. Characteristics

1. Required results — All desired ends are spelled out

2. Verifiable — Product or system is capable of measurement test and evaluation

3. Meets stipulated criteria — Attributes are chosen and criteria established to fully define expected performance

4. Free from unnecessary process limitations — Only essential restrictions are placed on the product

B. Format

1. Requirement — Specifier's statement of a discrete technical need or expected result

2. Criteria — Specifier's statement of the limit or standard by which performance of the item is to be measured

3. Test Method — The process of checking a component for conformity to performance criteria

4. Evaluation — The process and judgment required to link the criteria and test for acceptance/rejection

5. Example format

C. Advantages/disadvantages

1. Advantages

a. Encourages maximum contractor creativity in choice of material, fabrication and construction techniques

b. Ideal for developing new products/methods where innovation is required

2. Disadvantages

a. Loss of product/method control

b. Difficulty in finding suitable tests and establishing parameters that do not conflict

c. Not practical for entire structures

d. Possibility that requirements cannot be met with technology currently available

D. Enforcement

1. No control over choice of material, fabrication or installation techniques

2. Only control is in the determination of whether the finished product satisfies all stated performance factors

E. Examples

1. Areas to be paved and other areas requiring compaction shall be compacted to 90% of the maximum density except for the top 6 inches which shall be compacted to 95% maximum density. Field density tests shall be in accordance with ASTM D 1556-82.

2. Design mixes to provide concrete with a 28-day compressive strength of 3000 psi with a minimum 3-inch, maximum 4-inch slump. Concrete specimens shall be made and cured in conformance with ASTM C31-69 and tested in conformance with ASTM C39-72. Slump shall be determined in conformance with ASTM C143-78.

VII. APPLICATION/TECHNIQUES

A. Mixing methods

1. Rarely used independently

2. Mixed to obtain maximum advantage of each method

3. Avoid mixing performance and descriptive specifications

B. Specifying sins

1. Misdirecting Instructions

2. Cold Copying

3. Pinpointing

4. Potpourri

5. Puzzle Making

6. Fiction Writing

7. Taking over

C. Specification writing objectives

1. Clear

2. Concise

3. Correct

B. Approaches

1. Every statement costs money

a. Cost of typing, reproduction and manpower

b. Duplication harder to avoid

c. Cross referencing difficult Contractor assigns dollars on every statement

2. Written to contractor only

a. Use precise language, but don't lose clarity

b. Be specific — low level of abstraction

3. Practical method or desired result

a. Don't tell contractor how to do something that you really don't know how to do

b. Get practical methods from other engineers, literature or trade associations

c. Don't fake it

4. Specification preparation

a. Use a standard specification system

b. Coordinate

c. Amplify if necessary — Don't conflict

d. Avoid repeating

e. Production

Cutting and pasting is dangerous. If you must, check all reference and review materials and quality standards.

f. Jobs are seldom the same

D. Words

1. Verbs

a. Will

b. Shall

c. May

d. Provide

2. Use with care

a. All

b. Any

c. Or

d. And, at

e. Either, both

f. Each

3. Meaning

a. Clean

b. Smooth

c. Square & true

d. Level

e. Exact

4. Legalese

a. Same, said

b. Hereby, hereinafter

c. Therein, thereto

5. Abbreviations

a. Clarify

b. Define

6. Scope of work statements

   a. List problem

   b. An abstract, not all-inclusive

   c. Use in Division 1

   d. Use in technical sections

   f. Clarify related work in other sections

E. Editing

1. Coordinate sections

2. Inapplicable text

3. Repetition, duplication

4. Cross references

5. Format

6. Terms

7. Final numbering

SESSION 7
CONSTRUCTIBILITY REVIEWS

SKILL:

1. To review project plans and specs for clarity and to determine if construction of the facility and its features is practical as indicated.

2. To comprehend that a constructibility review can improve contracts; to know the responsibilities of the individuals to conduct a constructibility review.

3. To integrate skills from prior sessions to be able to specify areas of concern.

FORMAT: Formal lecture, group discussion, case studies, guided hands-on application

I. DEFINITION

A review of project plans and specs whose purpose is to determine their clarity and to determine if construction of the facility and its features is practical as indicated.

II. INTERACTION OF REVIEW WITH TECHNICAL AND FUNCTIONAL REVIEWS

A. Conflict — No

B. Overlap — Yes

C. Complement — Yes

III. ERRORS AND OMISSIONS IN FINAL PLANS AND SPECIFICATIONS

A. Wasted effort necessary to execute and process contract modifications to correct errors, omissions, and ambiguities in contract documents

B. Higher construction costs which result from negotiating corrections to contract documents after award rather than reliance on competitive bidding to provide cheapest cost

C. Subsequent contractor claims which increase contract cost and may delay contract completion

D. Increased administrative effort requiring a diversion of resources from contract administration and the primary quality assurance effort

E. Delayed contract completion on which may cause customer dissatisfaction

IV. ASPECTS OF OMISSION AND COMMISSION

A. Local site conditions and restrictions

B. Local labor availability and skills

C. Local materials

D. Local construction customs

E. Building configuration

F. Construction phasing requirements, including weather

G. Demolition

H. Long-lead construction or equipment items

I. Special construction equipment requirements

V. WHO PERFORMS CONSTRUCTIBILITY REVIEWS

VI. WHEN SHOULD CONSTRUCTIBILITY REVIEWS BE PERFORMED

VII. WHAT IS REVIEWED

VIII. HOW TO PERFORM REVIEW

A. Prioritize

B. Time

C. Experience

D. Checklists

IX. HOW TO SUBMIT COMMENTS

SESSION 8
CONTRACT DOCUMENTS AND SPECIFICATIONS IN PERSPECTIVE

SKILL: 1. To demonstrate understanding of construction documents and their relation to each other in the execution of the contract.

2. To establish consistent decision-oriented problem-solving methodology.

FORMAT: Non-guided hands-on application, exercises

I. REVIEW

II. GOALS

A. Contractor

1. Contract
2. Speedy Completion
3. Cooperation & harmony
4. Good profit
5. Goodwill
6. Prompt payment

B. Owner

1. Lowest possible bid
2. Earliest possible use
3. Compliance
4. Quality work
5. Conscientious performance
6. Follow-up corrections

III. THE DECISION PROCESS

A. Define the decision situation

B. Develop evaluation model

C. Develop preliminary system model

D. Select analysis models

E. Synthesize alternatives

F. Analyze alternatives

G. Evaluate alternatives

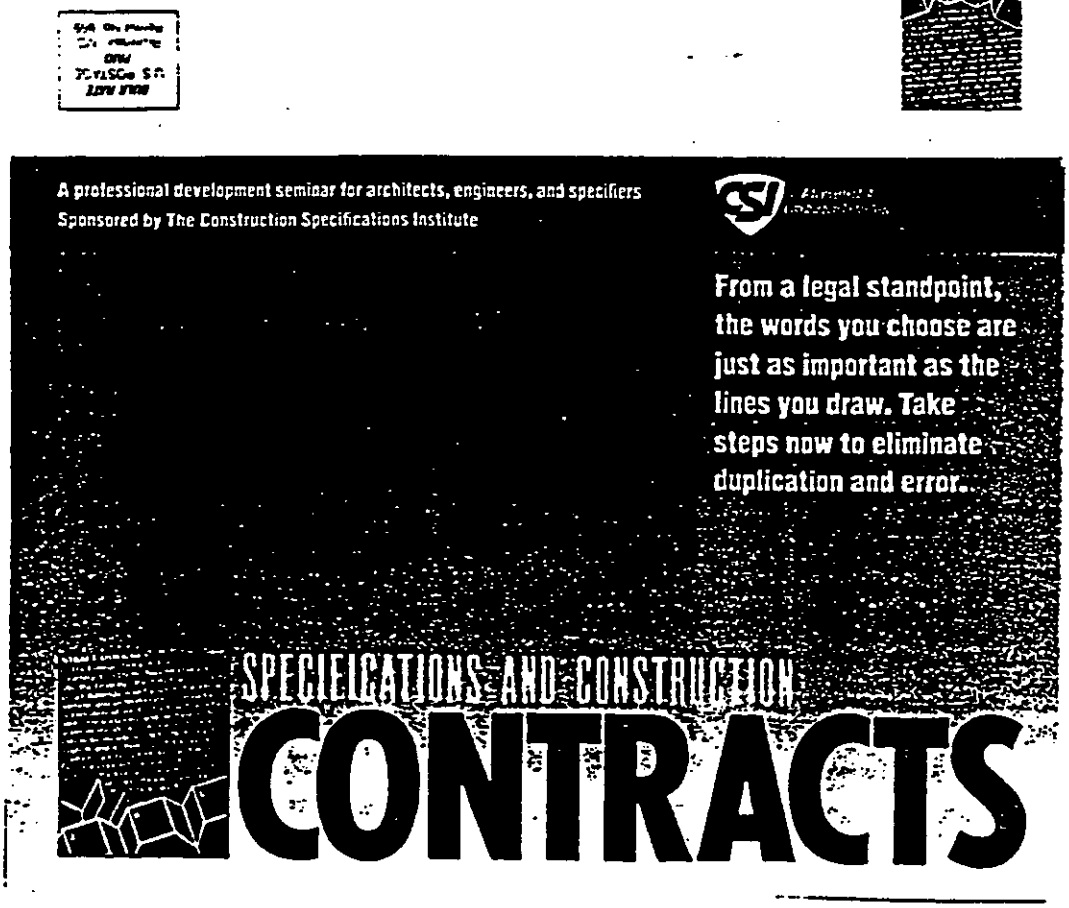
H. Decide

I. Communicate

IV. EXERCISES

APPENDIX P
THE CONSTRUCTION SPECIFICATIONS INSTITUTE:
SPECIFICATIONS AND CONSTRUCTION CONTRACTS

The Construction Specifications Institute, Inc.
601 Madison Street,
Alexandria, Virginia 22314-1791



About the Program

Construction specifying practice is changing. Tolerance for individual variation in document preparation has diminished in today's complex market where tight budgets, increased professional liability, and frequent construction claims are the norm. The construction industry is standardizing procedures and automating production techniques for more reliable and cost effective documents.

CSI's comprehensive system for documentation and formatting is at the forefront of this change. Its principles and recommended practices, outlined in CSI's Manual of Practice, are widely accepted as the industry standard.

Duplication, omissions, and ambiguity in the contract documents can cost a design firm time and money and put its reputation in jeopardy. Find out how CSI's documentation system can improve inter-office communication, streamline document production, and protect your company from legal entanglements.

General Information

Monday-Wednesday
March 7-9, 1988
CSI members: $425
Non-members: $475

Seminar Site

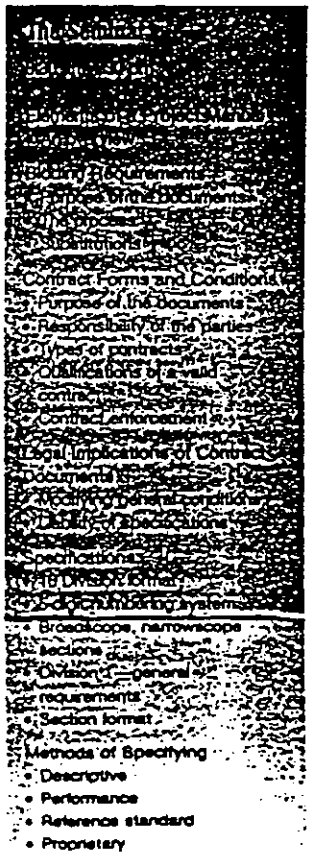
Old Colony Inn
625 First Street
Alexandria, VA 22314
(703) 684-6300

Overnight Accommodations

A block of rooms at a preferred rate is reserved at the Old Colony until February 6. Please request CSI rate when making reservations.

Room rate: Sunday—$[illegible] single
Monday-Tuesday—$[illegible] single

Complimentary shuttle from Washington National Airport



Instructors

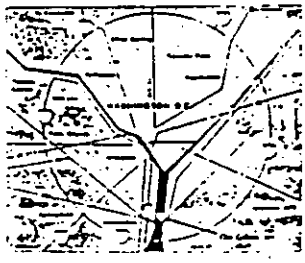
Sheldon B. Israel, FCSI, CCS is President, Tecon, Inc., construction technology consultants in Ft. Lauderdale, Florida. A Certified Construction Specifier and respected consultant for architectural and engineering firms nationwide, Israel has 25 years' experience in contract administration and construction specifications.

Israel serves as principle instructor for the Institute's course on specifications and construction contracts and is an excellent public speaker. He arbitrates construction disputes for the American Arbitration Association.

Joseph H. Kasimer, Esq. is a partner in the law firm Kasimer and Ittig in Vienna, Virginia. Specializing in construction contract litigation and claims, he represents owners, architects, general contractors, subcontractors, sureties, and suppliers throughout the United States.

An experienced public speaker and author on issues of construction law, Kasimer contributes frequently to CSI's *Construction Specifier* magazine. He teaches for CSI, Engineering News Record, and the Government Contracts Learning Center.

George A. Van Niel, FCSI, CCS is Vice President, Studio Director for Trott & Sean Architects, Inc., in Columbus, Ohio. A specialist in construction specifications preparation, he has 25 years' experience in materials research and project administration.



Van Niel is an associate professor in the School of Architecture at Ohio State University and a frequent public speaker for national construction industry organizations. He is co-author of *Site Spec Handbook*, a master guide specification for site and landscaping work, and author of *Project Manual Checklist*, a checklist for specification text preparation.

Mark J. Kalin, CCS, is president of Kalin Associates, a Massachusetts firm that specializes in preparation of master specifications and project manuals. A registered architect with 15 years' experience, Kalin is the author of *Master Outline Specifications* and *Master Short Form Specifications*. He has spoken nationally for AIA, CSI, and A/E Systems on CADD and automated specifications.

About CSI

The Construction Specifications Institute, founded in 1948, is a not-for-profit organization dedicated to the advancement of construction technology through communication, education, research, and service. CSI serves the interests of architects, engineers, specifiers, contractors, product manufacturers, and other in the construction industry.

In-House Training

This seminar can be presented to your organization and offered at a site convenient to your participants. For questions, call the Manager, Education Programs at (703) 684-0300.

Special Features

CSI principles and recommended practices are demonstrated through lecture, readings, group discussions, written exercises, and case study analysis.

Participants receive a complete copy of the CSI Manual of Practice and MASTERFORMAT as the course text.

Attendance is limited to 48 people to allow for group interaction and individual attention.

Continuing Education Units

This program meets criteria for the nationally accepted Continuing Education Unit. Upon successful completion of this program participants will be awarded 1.2 CEUs. CSI issues certificates of completion and maintains records of non-credit educational experience.

Registration

Because of attendance limits you may want to call CSI at (703) 684-0300 to reserve a place in the seminar.

Your registration will be confirmed by mail following receipt of payment. Make your check payable to CSI or charge your registration to VISA or Mastercard.

The registration fee includes instruction, course text, daily refreshments, and luncheon on the first day. Other meals and overnight accommodations are excluded.

Cancellations made less than seven calendar days prior to the seminar are subject to a $50.00 charge. No refunds will be made once the program has begun.

Mail your registration to

CSI
601 Madison Street
Alexandria, VA 22314-1791

Specifications and Construction Contracts
Monday-Wednesday,
March 7-9 1988
Washington, D.C.

Name _____

Firm _____

Address _____

City, State, Zip _____

Daytime Phone (Area Code) _____

Occupation _____

Years Experience _____

CSI Member _____ $425

Non-Member _____ $475

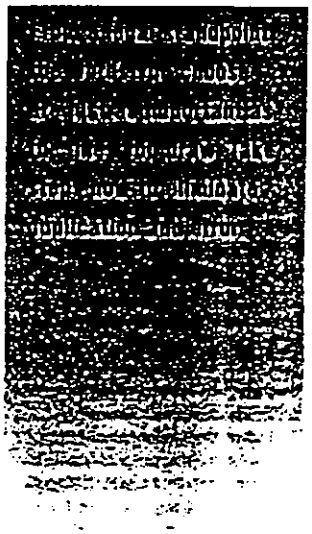
☐ Payment enclosed
(Make check payable to CSI)

Charge to:
☐ VISA
☐ Mastercard

Credit Card Number _____

Expiration Date _____

Signature _____ Date _____



Some specifiers are still writing sentences like this

SCOPE OF WORK: This contractor should furnish and install all metal lockers, as shown on the drawings or specified hereinafter or elsewhere and as required and approved by the architect-engineer to complete the intent of the design.

The problem is it uses 35 words where five will do. And in your contract documents, unnecessary words confuse rather than clarify. They increase the occasion for duplication errors, and omissions and they take up extra time and space.

How long has it been since you edited your office master or examined the routine phrases used in document preparation? If your office is writing contract documents the same way it did a decade ago, it's time to bring them up to date.

In this course we'll look at the legal implications of the specifications and compare the new AIA standard general conditions with the latest EJCDC standard general conditions. We'll discuss commercial guide specifications and consider computer applications that can streamline document production.

Take this opportunity to examine and update your specifications practice. Join us in Washington, D.C.

Sincerely,

Leroy D. Kimmons

Leroy S. Kimmons, FCSI, CCS
Vice President, CSI

The Construction Specifications Institute, Inc.
601 Madison Street,
Alexandria, Virginia 22314-1791

APPENDIX Q
PROGRAM BUDGET
UF DIVISION OF CONTINUING EDUCATION

DATE March 23, 1989 ACCOUNT NUMBER _____
PROGRAM NUMBER _____

Program Title Determining Risk and Bid Desirability in Construction Contracts and Specifications
Location University of Florida
Dates & Times Five Meetings @ 1 1/2 day each TBA
Sponsors School of BCN and DOCE, UFL
Fees _____
Cost Sharing None

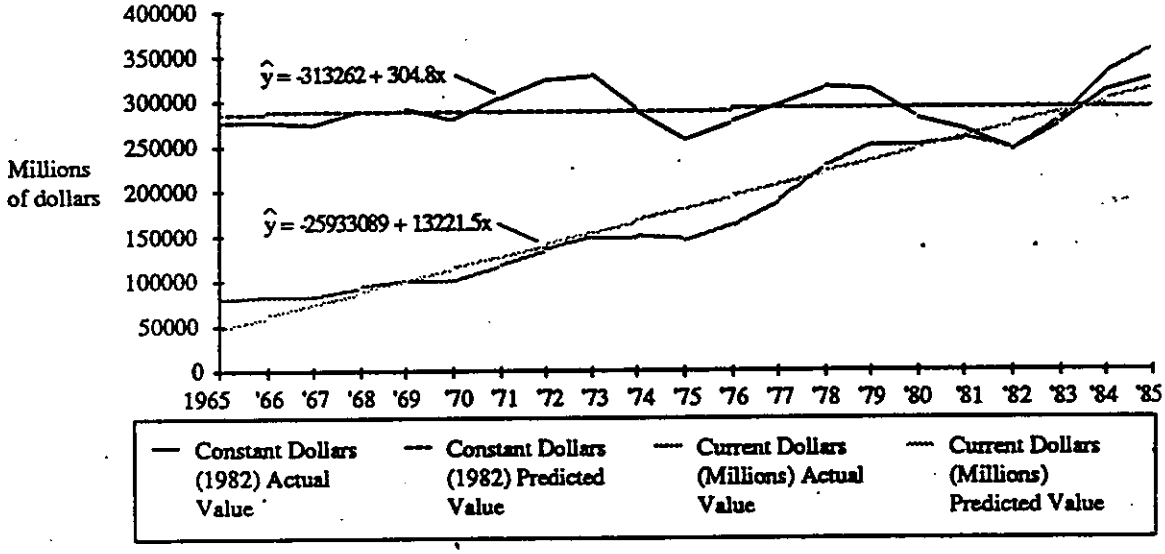
****

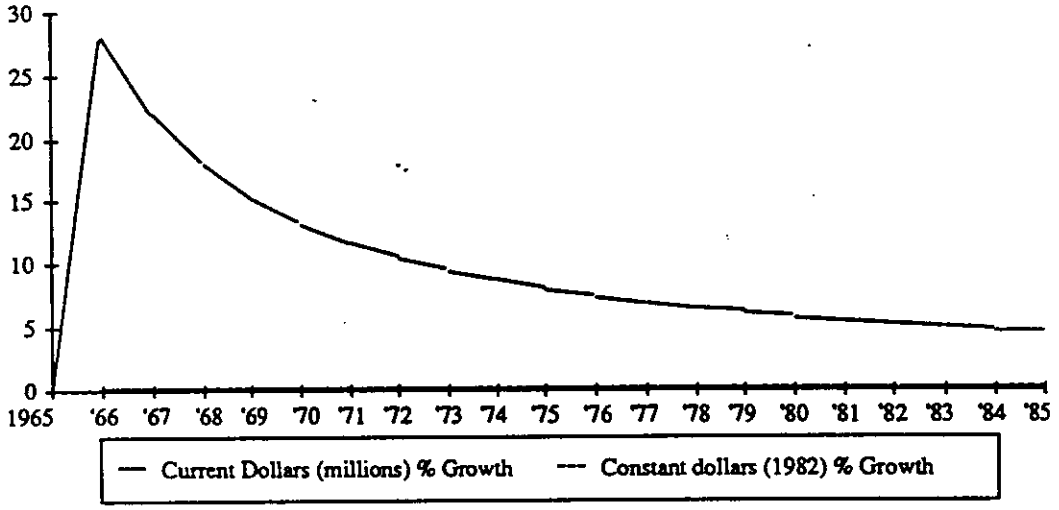
Income:	ESTIMATE	ACTUAL
50 Registrants @ 200	10,000	
_____ Registrants @ _____		
Other Income None		
Total Income		
Expenditures:		
Other Personal Services	5,200	
Printing	500	
Telephone	30	
Postage	650	
Travel		
Xerox		
Educational Materials	675	
Food		
Housing & Space Rental	200	
Other OPS travel rem.	450	
Other		
Other		
F/A Expenditure Fee - (1%)	77	
DOCE's Admin. Fee - 15%	1,167	
Total Expenditures	8,949	
Net:	1,051	

Approvals:

UF Co-Sponsor	Date	Coordinator, DOCE	Date	Dean, DOCE	Date
Dean, Sponsoring College	Date	Director, DOCE	Date		

APPENDIX R
REGRESSION ANALYSIS





Source: U. S. Bureau of the Census, *Construction Reports*, series C30., 1986

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