Can ASCE Cover the "E" in the MOE?

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Abstract

The American Society of Civil Engineers (ASCE) is beginning to move the profession in the direction of requiring a certain body of knowledge (BOK) for professional licensure. This BOK would be obtained through a baccalaureate (BS) degree, work experience, and a master's degree or equivalent (MOE). The "or equivalent" caveat was voted on in October of 2001 by the ASCE Board of Direction as a revision to the original Policy 465, and further defined by ASCE's Board of Direction at its October 2004 meeting. A big question remains: "If a master's degree is not the chosen route for many civil engineers, who will supply 'an equivalent' body of knowledge?"

This paper reviews the BOK proposed for future licensure that will be required beyond the BS degree. Then, parallels are drawn between the proposed BOK and current coverage by ASCE continuing education seminar offerings. Additional parallels are drawn between the content of typical seminars and the content of traditional master's courses using a case study approach. Finally, the traditional forms of ASCE continuing education are broadened to include post seminar assignments (with conference calls and/or chat rooms), seminar bundling, alternative knowledge delivery (distance learning, video conferences, etc.), and alternative credit options to create something equivalent to a traditional master's degree in meeting the BOK.

Introduction

At its October 2004 meeting, ASCE's Board of Direction adopted a policy statement on the Academic Prerequisites for Licensure and Professional Practice. The policy states that:

- *ASCE supports the attainment of a Body of Knowledge for entry into the practice of civil engineering at the professional level.*
- *Fulfillment of the Body of Knowledge will include a combination of: a baccalaureate degree; a master's degree, or approximately 30 coordinated graduate or upper level undergraduate credits or the equivalent agency/organization/professional society courses providing equal quality and rigor; and appropriate experience based upon broad technical and professional practice guidelines which provide sufficient flexibility for a wide range of roles in engineering practice.*[1]

We are beginning to see a concerted movement in this direction as initial objections to Policy 465 dissipate. A big question remains: "If a master's degree is not the chosen route for many civil engineers, who will supply 'an equivalent' body of knowledge?"

ASCE's Continuing Education Program could play a key role in meeting this need. ASCE has more than 30 years of experience with post baccalaureate (continuing) education. Experienced practitioners and master educators deliver timely knowledge and skills through various 2-day and 3-day seminars. Currently, over 250 seminars are held each year in all of the major sub disciplines of civil engineering.[2] Is it possible that a mechanism is already in place to deliver the

remainder of the BOK to civil engineers with baccalaureate degrees who don't have the desire or means to obtain a traditional master's degree? Or do current ASCE continuing education offerings lack the breadth or depth to meet the requisite BOK?

Alternatives to the Traditional Master's Degree

One of the characteristics of education in the United States is the large number and diversity of organizations providing education/continuing education programs. This includes universities, non-profit organizations such as professional societies and trade associations, for-profit training organizations, government agencies, and consulting firms. In recent years, the number of organizations providing education/continuing education programs for engineers has increased significantly. This trend is being driven by the increasing number of states which have a continuing education requirement for professional engineering (P.E.) license renewal, rapid advances in technology, and the need to maintain professional competence.

University Non-Degree and Certificate Programs

In addition to degree programs, many universities offer non-degree and certificate programs that include a large number of courses that would be relevant to attainment of the BOK through the MOE (also called the bachelors plus 30 hours, or the B+30 path). Some of these programs are offered by departments in which ABET accredited programs exist. Others are offered by departments which do not have an association with ABET or with engineering. For example, the University of Wisconsin-Madison[3] offers more than 400 continuing education courses for engineers, architects, managers, and other technical professionals and Drexel University[4] offers masters and certificate programs in engineering management.

Programs Offered by Non-Profit Organizations

Non-profit organizations, such as professional societies and trade associations, regularly offer continuing education programs. The key purpose is the advancement of the body of knowledge in their fields. Their mission statements often stress their commitment to continuing education. Continuing education programs offered by professional societies and trade associations serving the engineering profession often assist their members in earning Continuing Education Units (CEUs) or Professional Development Hours (PDHs) needed for P.E. license renewal. This is particularly true of non-profit organizations which serve the civil engineering profession.

Many professional societies and trade associations offer continuing education programs of relevance to civil engineers. Examples of these organizations include:

- American Society of Civil Engineers (ASCE)[2]
- American Council of Engineering Companies (ACEC)[5]
- National Society of Professional Engineers (NSPE)[6]

Programs Offered by For-Profit Organizations

With the advent of online delivery of education/continuing education and the increasing demand from engineers, for-profit organizations have begun to play a more important role as education providers. The providers of engineering education include PDHengineer.com[7], RedVector.com[8], and WorldWideLearn.[9] These providers offer online courses on both management and technical topics. Typically, they market themselves as "Board-approved" continuing education providers for engineers, land surveyors, and architects. The niche of most for-profit providers to date has

been online delivery of continuing education. However, by expanding the breadth and depth of the courses offered and by putting in place more rigorous testing and assessment, these programs could provide a viable option for engineers who choose the B+30 path.

Programs Offered by Government Agencies

Many government agencies design, develop, and deliver continuing education. Typically, these programs are designed to meet specific job requirements. The content and quality of this training can vary widely. Some state departments of transportation (DOTs) and other large state agencies contract with their state universities or with other recognized education providers to develop and deliver training. However, many agencies develop technical training with in-house resources. Government agencies that provide in-house training include the Army Corps of Engineers, the National Transit Institute (NTI), the Army and Air Force engineering schools, and the National Highway Institute (NHI). NHI is a unique organization in that it is tasked with identifying the unmet training needs of surface transportation engineering professionals and developing education and training to meet those needs. In addition, NHI offers developed courses to any organization that requests them. In fact, they will respond to training needs as identified in legislation and policy as well as those identified by employees and managers.[10]

Programs Offered by Consulting Firms

Many large engineering consulting firms provide continuing education programs for employees (and in some cases for clients). These programs vary considerably in their size and complexity depending on the size and resources of firms. As you might expect, firms tend to develop curriculum focused heavily on business management and performance improvement. Technical training tends to focus on specialty areas and skills that are project driven. These technical and management courses may be provided through a variety of delivery methods including live, instructor-led web conferences, asynchronous (on demand) online courses, and courses on CD.

There are no known statistics available on the number of engineering firms which currently provide continuing education to their employees. Census data indicates that most engineering firms are relatively small. 97.3 percent have fewer than 100 employees. Therefore, it is likely that most engineering firms buy continuing education services from a variety of sources in lieu of developing and offering their own programs.

ASCE's Continuing Education Program

The American Society of Civil Engineers (ASCE) has had a continuing education program in place since 1973. In recent years, the program has had significant growth. In a typical year, ASCE holds nearly 300 public (open enrollment) seminars covering approximately 100 different topics (both technical and management), as well as 50 or more customized on-site training programs for both private firms and government agencies. In addition to its many live, face-to-face programs, ASCE offers many distance learning opportunities including live, instructor-led web seminars, asynchronous (on-demand) online courses, courses on CD, and courses on videotape and audiotape. More than 18,500 civil engineers participated in ASCE's continuing education programs last year.[2]

ASCE is a member of the International Association for Continuing Education and Training (IACET), is an authorized provider of Continuing Education Units (CEUs), and complies with

the IACET criteria for offering CEUs. In addition, ASCE follows the NCEES Guidelines on Continuing Professional Competency. All of ASCE's live, face-to-face seminars and many of its distance learning programs offer CEUs.

The Society's Department of Continuing Education has an 11-person staff. Oversight of ASCE's Continuing Education Program is provided by ASCE's Committee on Continuing Education. ASCE's seminars and distance learning offerings are generally developed by practicing civil engineers (along with some university faculty members) and are crafted to meet the needs of practitioners. The engineers who develop and teach courses for ASCE's continuing education program work with ASCE as independent contractors. A peer review process involving relevant technical or professional committees is used to ensure that seminar instructors are well qualified and that course content is of high quality and maximum relevance.

Most of ASCE's live, face-to-face seminars are 14 to 15 hours in length. Distance learning programs range in length from one-hour live web seminars to asynchronous online courses as long as 35 hours. Engineers who take distance learning programs are required to complete and pass a post-test in order to earn CEUs.

The BOK and ASCE Offerings – A Comparison

What should 21st century civil engineer be required to know prior to licensure? This is a question that ASCE has been wrestling with for almost a decade. The process of answering that question has been accelerated with the passage of Policy Statement 465, unanimously adopted by the ASCE Board of Direction in 2001. The policy states that the Society "…supports the concept of the master's degree or equivalent as a prerequisite for licensure and the practice of civil engineering at the professional level." This was followed by the creation of the Committee on Academic Prerequisites for Professional Practice (CAP3) to "develop, organize and execute a detailed plan for full realization of Policy Statement 465." CAP3 then formed the Body of Knowledge (BOK) Committee with a charge to define the "Body of Knowledge" needed to enter the practice of civil engineering at the professional level (licensure) in the 21st Century."[1]

The BOK Committee's final report[11] was released on February 25, 2004 at a press conference held at the National Academy of Engineering. The Committee reported on "***what*** should be taught to and learned by future civil engineering students; 2) ***how*** should it be taught and learned; and 3) ***who*** should teach and learn it."[11] The primary emphasis of the report and this paper is on the ***what***. This BOK is stated in terms of 15 learning outcomes, the first 11 coincide with current Accreditation Board of Engineering and Technology (ABET) outcomes, which ABET uses to accredit undergraduate (BS degree) civil engineering programs. Four new outcomes prescribe additional breadth and more technical depth. The executive summary provides a quick overview of the BOK. Specifically, "the 21st century civil engineer must demonstrate [11]

1. *an ability to apply knowledge of mathematics, science and engineering.*
2. *an ability to design and conduct experiments, as well as analyze and interpret data.*
3. *an ability to design a system, component, or process to meet desired needs.*
4. *an ability to function on multi-disciplinary teams.*
5. *an ability to identify, formulate, and solve engineering problems.*
6. *an understanding of professional and ethical responsibility.*
7. *an ability to communicate effectively.*
8. *the broad education necessary to understand the impact of engineering solutions in a global and societal context.*

9. *a recognition of the need for, and an ability to engage in, life-long learning.*
10. *a knowledge of contemporary issues.*
11. *an ability to understand the techniques, skills, and modern engineering tools necessary for engineering practice.*
12. *an ability to apply knowledge in a specialized area related to civil engineering.*
13. *an understanding of the elements of project management, construction, and asset management.*
14. *an understanding of business and public policy and administration fundamentals.*
15. *an understanding of the role of the leader and leadership principles and attitudes.*

Figure 1 depicts the 15 outcomes along with the levels of competence expected prior to licensure through formal education and experience. The competence levels are in ascending order from recognition (familiarity) through understanding (comprehension) to ability (competence). For most outcomes, the ability level will not be obtained through education alone. Indeed, the ability level may not even be obtained prior to licensure in some outcomes.

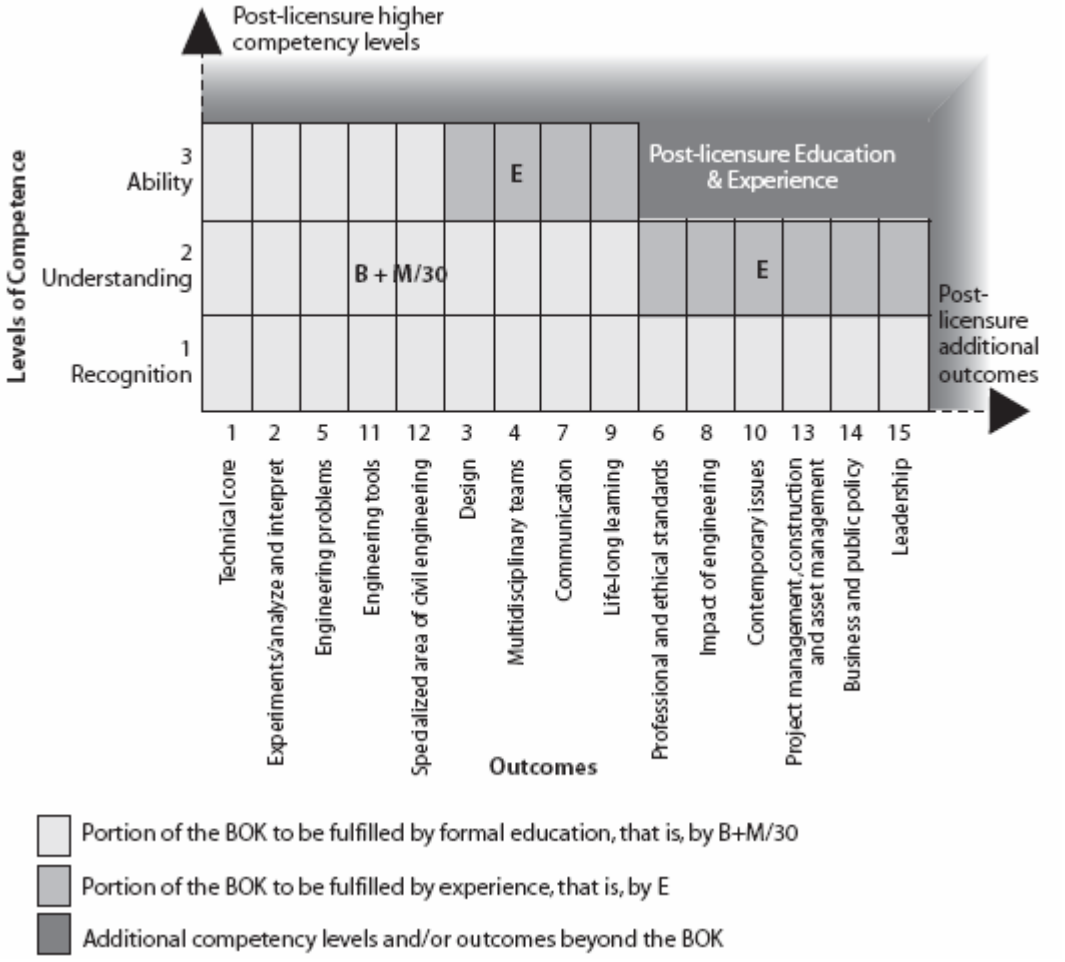

Figure 1: The ASCE - BOK integrating outcomes, levels of competence, formal education, and pre-licensure experience. [11]

The primary interest in this paper is that part of the BOK fulfilled through the educational component of an engineer's training. The curriculum subcommittee of CAP3 is working on the segregation of responsibilities in the educational component of the BOK; that is, which components will be fulfilled by a traditional bachelor's program and which will be acquired by the civil engineer beyond the bachelor's degree (i.e., B + M/30). Preliminary discussions within that committee indicate that the only addition to the BOK expected of the master's degree or equivalent is outcome 12: "specialized area of civil engineering." This outcome requires significant depth in one area of civil engineering to the ability level that is not likely to be obtained at the undergraduate level. All other outcomes to their appropriate level of competency (the light gray area in Figure 1) will be obtained through undergraduate education.[12]

This begs the question that is the premise of this paper: "If a master's degree is not the chosen route for many civil engineers, who will supply 'an equivalent' body of knowledge?" Most master's programs are set up to provide specialization, which often builds upon the more generalized knowledge coming from the bachelor's program. However, can civil engineers obtain the specialization through "equivalent" course offerings? More specifically, can they obtain specialization through ASCE continuing education offerings?

Let's take a look at current seminar offerings in the senior author's area of expertise (hydraulics and water resources). There are currently 18 seminars being offered entitled: [2]

- Artificial Recharge
- Detention Pond Design: Parking Lots and Urban Drainage
- Floodplain Modeling and Mapping with WMS
- GIS Applications in Water, Wastewater, and Stormwater Systems
- HEC-HMS Computer Workshop
- HEC-RAS Computer Workshop
- HEC-RAS Computer Workshop for Unsteady Flow Applications
- Hydrologic Modeling with GIS and the Watershed Modeling System (WMS)
- Hydrologic and Hydraulic Design of Culverts
- Introduction to Streambank Investigation, Stabilization, and Restoration
- Low Impact Development Applications for Water Resources Management
- Pump Reliability for Operators and Mechanics
- Pumping Systems Design for Civil Engineers
- Security Risk Assessment Procedures: Countering Terrorism and Other Threats
- Surface Drainage Design Workshop
- Toe Scour Evaluation for Channel Restoration, Flood Control, and Biotechnical Streambank Stabilization Projects
- Two Dimensional Hydraulic Modeling of Complex Waterways with SMS
- Water Hammer in Transmission and Distribution Systems

These can be augmented by related offerings in the environmental category entitled: [2]

- FEMA National Flood Insurance Program
- NPDES Stormwater Permit Compliance
- Stormwater Management for Phase II Communities

- Stormwater Utilities
- Urban Watershed Management BMPs
- Water Distribution Modeling: Emphasizing Pollution Control
- Water Quality Modeling
- Wetlands and 404 Permitting

This is a pretty comprehensive list of specialty courses, even for a traditional master's program. We recognize that the seminars are not at the same level as traditional graduate courses. (This will be discussed more in the next section.) However, there are a lot of attributes found in this listing of courses. For example, it would certainly go a long way in providing the depth (Outcome 12: specialized area of civil engineering) that is expected by a master's degree in fulfilling the BOK. In addition, other outcomes in the BOK are being covered by the computer modeling seminars (Outcome 11: Engineering Tools), timely topics such as low impact development and security risk assessment (Outcome 10: contemporary issues), and infrastructure management in the stormwater utilities seminar (Outcome 13: asset management). Additional breadth in the BOK can be obtained by taking seminars in the areas of construction/development, infrastructure rehabilitation, and project and personnel management. ASCE also has many offerings through distance learning, conferences, and self-study.

Content Comparisons at the Course Level – A Case Study

As previously mentioned, the content and depth of an ASCE seminar and a typical graduate level class are likely to be very different. For starters, a two-day ASCE seminar generally contains about 15 contact hours with the attendees and a typical graduate class contains 42 to 45 contact hours. It may be enlightening to make other comparisons between the two to see if there is enough commonality to structure "an equivalent" master's program from ASCE offerings.

The senior author has been teaching ASCE seminars for 15 years. His current ASCE seminar offering contains content from a graduate class at Rose-Hulman Institute of Technology. The graduate class is worth four credits (quarter system), contains 40 contact hours, and "water resources engineering" is a pre requisite class. The catalog description is given below.

> *CE 567 Applied Hydrologic Modeling 4R-0L-4C Pre: CE 471* .
> Environmental planning, design, and management strategies are examined using computer simulation models. Students will be introduced to some of the most widely used models in the fields of hydrology, hydraulics, and stormwater quality (nonpoint source pollution).

The course emphasizes advanced algorithms contained in modern hydrologic/hydraulic computer models and the fundamentals of nonpoint source pollution control. The primary models that are introduced are HEC-HMS and HEC-RAS; both are written and supported by the U.S. Army Corps of Engineers. Similar courses are offered in many graduate programs.

A portion of this course is the focus of an ASCE seminar entitled "HEC-HMS Computer Workshop." The algorithms of the model are covered in detail, activity sessions are incorporated to solidify theory and design concepts, and hands-on use of the model is included. Between one-third and one-half of the graduate class is covered in the intensive two-day seminar, but it lacks the textbook readings and homework problems assigned in the graduate course.

Seminar Content Extensions and Seminar Bundling

As noted earlier, a typical ASCE seminar is 14 to 15 hours in length, and a typical master's course contains 42 to 45 contact hours. But the content exists in the numerous ASCE offerings for most major technical specialties. For example, in the Fall 2004/Winter 2005, ASCE offered 23 different short courses on environmental and water resources topics. It is conceivable that by broadening the scope of a short course (say to four or five days) and/or by bundling several short courses, the contact hour equivalency could be obtained. This still may not lead to an equivalent master's course because it lacks the textbook reading, homework, and study/testing component. Therefore, attendees could be given post-seminar assignments and an outcome assessment (i.e., testing or a final project) to complete the master's course equivalency.

One example of seminar bundling involves the ASCE HEC-HMS short course taught by the senior author. As previously stated, this short course covered a large portion of a hydrologic modeling graduate course. If this was bundled with the ASCE short course on HEC-RAS modeling, most of the content from the Rose-Hulman graduate course would be included. This would have to be followed by post seminar assignments which could be accomplished on-line through course management software (including drop boxes, chat rooms, and assessment). The attendees could be given the option of accepting CEUs or PDHs at the end of the seminar. As an alternative, if the attendees followed through with the post seminar requirements, they could earn super CEUs or some other designation representing 'an equivalent' to master's credit.

ASCE Curricula to Achieve the "E" of the MOE

Is it possible to put together a master's degree curriculum (course-based) with current ASCE offerings? Again, let's consider the technical specialty to be in the area of hydraulics/water resources. Course-based master's degrees at many universities require 10 classes (30 semester hours of courses). Table 1 shows a typical selection of master's courses that may constitute a program of study in the water resources/hydraulics area. Listed next to the courses are short-course selections from the current ASCE continuing education program.

It should be noted that there are only nine courses listed in Table 1 and 10 courses are typically required for a master's degree. However, many master's programs require a minor, which is often comprised of three courses outside the major program. Thus, flexibility in a potential ASCE program of study could come from their many course offerings in areas other than water resourses/hydraulics. For example, additional breadth could be built by taking courses in the following areas:

- Construction/development
- Infrastructure rehabilitation
- Project and personnel management.

The first four classes in Table 1 are very common in most civil engineering master's programs. If ASCE were to offer an "equivalent" to a master's program, more appropriate course offerings would be required to cover the most common and traditional classes offered in master's programs to give civil engineers the foundation they need for specialization.

Table 1: Master's Degree Program of Study Comparison in Water Resources/Hydraulics

Typical Master's Course Offerings	ASCE Short-Course Offerings
Urban Hydrology and Stormwater Management	• Surface Drainage Design Workshop • Stormwater Management for Phase II Communities • NPDES Stormwater Permit Compliance
Hydraulic Structures and Systems	• Hydrologic and Hydraulic Design of Culverts • Pumping Systems Design for Civil Engineers • Water Hammer in Distribution Systems
Groundwater Hydrology/Hydraulics	• Artificial Recharge
Open Channel Flow	• Floodplain Modeling and Mapping with WMS • HEC-RAS Computer Workshop • HEC-RAS Computer Workshop for Unsteady Flow
GIS in Civil and Environmental Engineering	• GIS Applications in Water, Wastewater, and Stormwater Systems • Hydrologic Modeling with GIS and the Watershed Modeling System (WMS)
Water Quality Modeling and Enhancement	• Water Quality Modeling • Water Distribution Modeling: Emphasizing Pollution Control • NPDES Stormwater Permit Compliance
Urban Infrastructure Engineering and Management	• Low Impact Development Applications for Water Resources Management • Pump Reliability for Operators and Mechanics • Pumping Systems Design for Civil Engineers • Security Risk Assessment Procedures: Countering Terrorism and Other Threats • Stormwater Utilities
River Hydraulics and Sediment Transport Engineering	• HEC-RAS Computer Workshop • Two Dimensional Hydraulic Modeling of Complex Waterways with SMS • Introduction to Streambank Investigation, Stabilization, and Restoration • Toe Scour Evaluation for Channel Restoration, Flood Control, and Biotechnical Streambank Stabilization Projects • Water Hammer in Transmission and Distribution Systems
Wetlands and BMP Design	• Detention Pond Design • Urban Watershed Management BMPs • Wetlands and 404 Permitting

What do Civil Engineers Think of the Approach?
The authors prepared a survey to gage the receptiveness of civil engineers to the MOE concept for future licensure and alternatives for obtaining the MOE. The surveys were given to practicing civil engineers attending different ASCE continuing education seminars (n = 43). The results are presented in Table 2.

Table 2: Results of a Survey Given to Civil Engineers attending an ASCE Seminar

Question	**B.S.**	**M.S.**	**Ph.D.**	**Other**
What is the highest degree you have currently obtained?	70%	23%	2%	5%
Question	**Yes**	**No**	**Unsure**	
Do you think the MOE should be required for licensure?	26%	70%	4%	
Do you think the MOE should be required for licensure by 2015?	30%	58%	12%	
If the MOE was required, would you seek licensure by getting the requisite education?	14%	5%	7%	74% already a PE
Question	**Traditional M.S.**	**Distance M.S. degree**	**Some equivalent**	
If you wanted to obtain an MOE, how would you accomplish it?	28%	12%	60%	

Based on the results found in Table 2, it is clear that there are still strong objections to the MOE initiative as a condition for licensure. Some of the objections dissipate when the forecast for requiring the MOE is shifted to 2015. However, keep in mind that most of the respondents are already licensed and have nothing to lose. It is not clear what the objections are, but based on their written comments, many felt that additional formal education would not produce "better" engineers. Most felt that experience was more important. In fact, one respondent suggested that s/he "would be in favor of extending the design experience requirement" for licensure.

The other obvious result of this limited survey has to do with obtaining the MOE if it was required. When faced with this difficult choice, most of the respondents would not obtain a traditional M.S. degree. However, 28% said they would go back to college to get their master's degree. The other 72% of respondents would like other choices. In a related question, 75% would like an MOE option using ASCE continuing education course offerings. It is certainly clear that if the MOE initiative is going to gain traction among practicing professionals, these choices will need to be available.

Alternative Knowledge Delivery and Credit Options
In recent years, distance education has begun to play a more significant role in delivering education and continuing education. This trend is fueled not only by advances in technology but also by the growing need for education/continuing education among engineers, as well as the larger workforce. For example, the Learning Resources Network (LERN) estimates that a

growth rate of 10 percent per year is needed in lifelong learning in an Information Age society where technology, jobs, and the workforce are changing so rapidly. In addition, Federal Reserve Chairman Alan Greenspan and other economists have cited education/continuing education as a key to U.S. competitiveness.[13]

In May 1997 Dr. Sylvia Charp, editor-in-chief of Technology Horizons in Education, noted that "the use of information technology in education is gaining irreversible momentum as it cuts across disciplines and enhances learning opportunities for all ages. Students gain access to information resources, faculty, lectures, demonstrations, conferences, outside activities, etc. that previously were not attainable." [14]

It is expected that distance education will play a significant role for those engineers who choose the B+30 path to obtain the knowledge, skills, and attitudes needed to practice engineering. However, it is also likely that most students who select the B+30 path will obtain the education needed through a combination of traditional live, face-to-face classroom delivery and distance learning (both live, instructor-led and asynchronous).

Regardless of the delivery method, a key to the B+30 path will be agreeing on a universal formula to convert CEUs and/or Professional Development Hours (PDHs) to credit hours. As defined by IACET, one CEU is "ten contact hours of participation in an organized continuing education experience under responsible sponsorship, capable direction, and qualified instruction." *One CEU equals 10 PDHs. It would seem reasonable that 4.5 CEUs or 45 PDHs would be the equivalent to a single masters-level course.

Conclusion

It is very likely that at some point in the near future, a master's degree or equivalent (MOE) will be required for professional licensure in the civil engineering profession. This is the direction that ASCE is heading and will likely by propelled further by continuing to focus on the body of knowledge (BOK) necessary for professional practice in the 21st century. It is also likely to be boosted by other engineering societies and state licensing boards examining the same questions. However, attention should be given to the needs and demands of practicing civil engineers. In particular, the question remains: "If a master's degree is not the chosen route for many civil engineers, who will supply 'an equivalent' body of knowledge?"

To fulfill the BOK, some engineers will continue to take the traditional path and matriculate into on-campus master's programs. Others may choose to take some classes on college campuses, but opt to take others through non-traditional providers. Still others may want to fulfill the BOK entirely through non-traditional providers. This is the challenge: the course offerings through non-traditional providers must be of the same quality and rigor found in traditional on-campus master's programs. Otherwise, we have added hurdles and complexity to licensure, but we have not increased the BOK for those achieving professional registration.

ASCE's Continuing Education Program could play a key role in meeting this need. It seems clear that there is a need for alternatives to traditional master's programs. It is equally clear that the ASCE Continuing Education Program could deliver the missing components of the BOK to

civil engineers with B.S. degrees who don't have the desire or means to obtain a traditional master's degree. However, to accomplish this will require some major program adjustments.

To help fulfill the BOK, ASCE's Continuing Education Program must supply a breadth of course offerings, increase the depth in those offerings, and work to establish a universal formula to convert CEUs and PDHs to credit hours. Their current breadth of course offerings is good and expandable once needs are identified. A greater challenge is establishing graduate course depth in those offerings. Course bundling, post seminar assignments (with conference calls and/or chat rooms), and alternative knowledge delivery (video classes/conferences, distance learning, etc.) must be expanded. And finally, alternative credit options need to be explored in concert with the appropriate agencies and education providers to truly create "an equivalent" to a master's degree.

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* Footnote: The CEU was established in 1970 in order to "create a unit of measurement that could be used to quantify continuing education and training activities." The CEU was "designed to serve the diversity of providers, activities, and purposes in adult education."