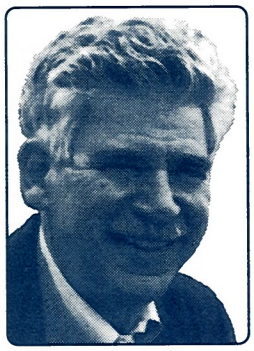
The ASCE
Los Angeles Section Monthly

VOL. XXXIX NO. 2 | Established 1913 | February 2000

PRESIDENT'S COLUMN

ASCE Members Respond to Last Month's Column— Education: Masters As The First Professional Degree



by
Henry Koffman
Los Angeles Section President

What are our "ever growing deficiencies" that we need to fix? Are we not designing things better than we ever have in the past? Are we not getting tighter tolerances, more accuracy, and more environmentally friendly as time progresses? If we were not progressing, or improving the capabilities of our profession then I could accept that statement, but it seems to me that every generation of civil engineers has built off of, and improved upon the base which was prepared for them by the previous generation. I resent that you seem to assume that since the educational system has changed since you were in school that my education is somehow inferior to yours. You seem to have not "analyzed" the "facts" that you stated. It seems quite obvious to me, that since we are able to do so much more now than we could even 15 years ago, that the educational system is doing quite well. If our profession was in some sort of disarray, then I would be more concerned with the educational system. However, it seems to me that we have never enjoyed as much prosperity and ingenuity, and opportunity in our profession as we do right now. No one can discount or dispute the role of younger engineers in helping to achieve this level of prosperity.

I disagree with the society's position on a Master's degree as the first professional degree. As a young engineer without a master's degree who has not yet taken the PE exam, it is obvious that I would be biased in this direction. However, the arguments that I have heard that are in favor of the Master's degree becoming the first professional degree (increase prestige and salary as an engineer) don't really make too much sense to me. There is not enough room to discuss the specific reasons these argument do not make sense to me within this response.

If the issue is in fact education, adjust the curriculum so that engineers are better prepared at graduation. Increase ABET accreditation standards. Integrate G.E. requirements (English, Biology, History, etc.) with Engineering requirements. As far as the reduction in class credits required for graduation is concerned, I attended a private college where religion classes were required in addition to G.E. classes and the Engineering requirements. The University mandated that each college reduce its required class load so that students could earn a bachelor's degree in four years. With the religion requirements, this made it very difficult for the college of engineering. What they ended up doing, essentially, was to simply reduce the credit hours associated with some of the required classes without changing any of the class requirements. Therefore, the reduced number of credit hours required can be deceiving if it is assumed that the students are doing less work for their degrees.

If the real issue is public safety or quality of work, please present some results of research that suggests an increase in public safety of quality of work with a Master's degree. I am definitely in favor of continuing education. I even have plans to go back and get a master's degree. However, I don't think that making a masters degree a pre-requisite to being an engineer would help accomplish the stated goals of the Society. I think that requiring continuing education in order to maintain professional licenses would do far more to improve the quality of engineering work than requiring a Master's degree.

◆ **Jon R. Gilchrist, EIT, Irvine, CA**

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In This Issue

REMINDER:
Deadline for copy for the April newsletter is March 1, 2000

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My USC colleague Henry Koffman argues in favor of the Masters as Civil Engineering's first professional degree. Prof. Koffman cites a number of challenges he believes are met most effectively by this strategy. While I agree that these challenges are real, I disagree with the solution he and others propose. I suggest we go further, because the deficit in Civil Engineering curricula is not merely the limited opportunity to specialize. The curriculum pressures he cites also limit the breadth of education available to engineering students, and the way they are trained. Using the MSCE as the first professional degree addresses part of the problem, but does not go far enough. Undergraduate civil engineering degree programs should be extended from four years to five, and the BSCE should remain the first professional degree.

The fact that other credentials make the first professional degree a graduate degree does not make it essential for engineering to do the same. Engineering is not law or medicine. The responsibilities and functions of Engineers are different than those of physicians and attorneys, and the engineering profession should not feel defensive about relying on undergraduate education to establish competence.

The increase in general education opportunities for undergraduate engineering students is an important improvement in engineering curricula. Eliminating these courses would usually produce a marginally better technician, but a deficient college graduate. I contend these general education courses do not go far enough. Civil engineering curricula should include additional courses in written and oral technical communication. Engineering students take too many courses simultaneously. This limits their opportunity to master the material in these courses. Over the years, we have accepted curriculum trade-offs that too frequently constrain or eliminate student access to economics, engineering economy, probability and statistics.

Adding a fifth year to the professional curriculum would permit several objectives to be addressed at once. Students could take fewer courses per semester. Courses on economics, uncertainty, and technical communication could be added without displacing existing courses. Courses providing additional technical depth could be added. Making the MSCE the first professional degree adds more technical depth to the professional credential, but this is not enough.

Convincing university administrators to consider a five year BSCE degree will be difficult. It will likely be impossible for a private university to take the lead. With only a handful of exceptions, private universities face too many fiscal constraints to accept the risk and inherent disadvantages of going first. Their administrators must respond to reality that student demand for access to computer science, computer engineering, and electrical engineering education far outstrips the student demand for civil engineering credentials. The change to a five year undergraduate program would most likely have to begin with a public institution.

Four year degree options might be retained, especially at research institutions, but these would no longer constitute first professional degrees. These revised four year curricula could incorporate courses from allied disciplines, defining new credentials that would not lead to careers as professional civil engineers, but in which civil engineering concepts would have a prominent role, and which would provide students with ample opportunity in an technology driven economy.

◆ **James Moore**

James Moore is an Associate Professor of Civil Engineering -and- Public Policy and Management at USC. He is Associate Director of the National Center for Metropolitan Transportation Research (METRANS).

Hank, I agree a Masters degree should be strongly encouraged, especially among the current university student population. Just as I encourage my children to attend college and plan on continuing to the Masters level. Many of the better universities' engineering curriculums typically require a minimum of 5 years to complete. ASCE as an organization should not be dictating a 'Masters' as the first professional degree. ASCE should also be encouraging students to obtain work experience while in college, not requiring an additional degree. The master degree requirement does nothing for the "old timers" who have been out of school for decades.

I do not believe the Masters requirement will produce the desired results to introduce the new technologies to those who have refused to become computer literate or keep up with new advances and technology.

I do not support a Masters degree as a requirement. My local chapter has voted on this issue and if I recall correctly, after discussion, the San Luis Obispo Chapter did not support the concept of a Masters degree as the first professional degree, nearly unanimously.

We should all be working together, not dividing our forces with this issue. Please drop this proposed policy as a discussion item. It will not produce what is stated to be the desired result.

Thank you for your time,

◆ **Debra L. Larson, P.E**

Hank, Someone is reading your ASCE Newsletter column. Here's a little friendly opposition. I oppose the National ASCE position that we adopt the policy known as the "Masters as the First Professional Degree." The final stage of one's engineering education can only be realized in the workplace. A graduate (be it someone with a four year degree or a five year degree) will learn more about engineering in his/her first year "on the job" then he/she learned in four (or five) years of university training. Adding another year of technical training to the university curriculum will not increase the overall value of a graduate engineer.

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