



Maine PE News

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Introducing Students to the Engineering Profession

By Joyce Noel Taylor, PE

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Inside this issue:

- Introducing Students to the Profession of Engineering 1
- FE Results
SE Results
PE Results 2
- Rule Reminder 3
- Professional Development vs. Mandatory Professional Development 4-7

Many of us belong to different engineering associations or organizations that may participate in various STEM activities. All of us understand the value of having younger generations stay interested in these topics. I have found that the amount of middle school and high school students who have no idea what an engineer's job entails is alarming. Several years ago, I volunteered a day at my children's middle school to show each science class what I do as an engineer. One of the first questions I asked the students is what they thought engineers did for work. I was surprised at how few had an answer to this question, even when I asked about specific areas such as civil, mechanical and electrical engineering.

I've also had the opportunity to have numerous high school students job shadow with me at MaineDOT. Most of these students admit that they don't know what an engineer does. MaineDOT recently hosted a high school engineering class from New Hampshire at the new Sarah Mildred Long Bridge. About 10 out of the 15 students said they wanted to become Mechanical Engineers. Their teacher's curriculum did quite a bit with robotics and other mechanical areas so they were familiar with this discipline. Not one student expressed interest in Civil or Electrical Engineering.

My experiences surprised me, because I believed that there is so much emphasis on STEM in current curriculums that most students would have been exposed to something about engineering. The moral of this story is that we should assume the young people crossing our path are probably not aware of what a profession in engineering offers. I believe all of us need to look for opportunities to encourage students to think about engineering as a career. We are missing opportunities to get some talented students interested in our profession. I often asked the students in these classes if they thought a career in engineering would be boring, a surprising number of them said yes. I share all of this to challenge you to invest in Maine students. There are many ways to do so.

Some ideas to advance engineering with today's youth:

- See if your local middle school will let you give a presentation, especially if you have a connection to the school. Teachers are more receptive if you can

FE Exam Results Jul 2017 to Dec 2017

These individuals successfully passed the FE exam between June, 2017 and December, 2017.
The FE exam is a computer-based examination offered year-round at PearsonVue testing centers.

Natalie Altvater	Catherine Gillette	Eric Petersson
Ulrich Amoussou-Guenou	Joshua Girgis	Kendra Ramsell
James Andretta	Elisha Glusker	Michael Rancourt
James Baines	Anna Heath	Samantha Roenigk
Erin Ballew	Andrew Holt	Alexander Runser
Ethan Beaulier	Shane Howley	Andrew Schluntz
Dylan Belanger	Michael Hross	Sandra Spear
Sam Berner	Ashlee Husson	Preston Spicer
Caleb Berry	Garrett Kaspala	Ronald St. Pierre
Kaleb Bourassa	Cory Ladd	Michael Triglione
Daniel Dadmun	Marc Legere	Duy Vo
Christopher Desmond	Brady MacLeod	Robert Warren
Chandler Dundas	Nikko Noble	Tim Wells
Hannah Eshleman	Drew Olehowski	
Zachary Fehlau	Justin Ort	

Congratulations to those who passed the October 2017 PE Exam

Ehssan Amir Sayyafi	Jonathan Gay	David Lawrence	Harold Walton
Alexander Bailey	Ariel Greenlaw	Matt Legere	Alexander Wheelock
Daniel Bernard	Mathew Hardison	Luke Lorrimer	Nicholas Williams
Keith Berube	Wendell Harriman	Christopher Parent	
Charles Burnham	Nicholas Hartley	Eulan Patterson	
Devin Carrier	Allison Hazard	Whitney Plasket	
Mark Colca	Benjamin Heidebrink	Matthew Robinson	
Alexander Coulling	Shaleen Jain	Jesse Sawin	
Sara Coyle	Loren Joyce	Jeffrey Senders	
Jared Davis	Timothy Kenerson	Lucas Soo	
Paul Denis	Marc Khederian	Craig Sweet	
Aaron Gallant	Melissa Landon	Robert Sykes	



Approved seal format

Introducing Students to the Engineering Profession (cont.)

give them an agenda of what you will present. Students this age like visual presentations. I tailored mine to bridge building and environmental issues. I used the West Point bridge program which is a tool to design a bridge and then see if it can withstand a truck going across. The students loved it.

- Encourage a niece, nephew or high school student to think about job shadowing with you or another engineer. A half hour conversation with them is probably going to be more information than they have on what the engineering profession can offer as a career.
- Participate in one of your association or organizations STEM activities.
- Offer to facilitate a field trip or tour to show students a project.
- Act as a mentor to a high school student. I still have a few young adults I keep in touch with, I'm so proud of how they are progressing with their college studies.
- If you know teachers, offer to help them develop lesson plans or give them suggestions on web sites with interactive tools or graphics. When we hosted the class at the Sarah Mildred Long bridge, we showed them a 3D modeling of the bridge, which fascinated them.

I believe we are more influential than we think when it comes to helping young students explore engineering as a career. I encourage you to invest time in at least one student or activity in 2018 and see what you think. Together we can help shape future generations of Maine engineers.

Joyce Taylor, PE, is Chief Engineer at MaineDOT and an ex officio Board member.

RULES REMINDER:

Chapter 2, SECTION 7: Licensure Obligations

1. Licensees doing business with the public as a Professional Engineer must post the license in a location that is accessible to the public.
2. Licensees shall notify the Board of any change of address within 10 business days.
3. Licensees shall notify the Board of any criminal conviction within 30 days of final adjudication.
4. Licensees shall notify the Board of any discipline in any other jurisdiction within 30 days of final action.

Professional Development and

Most professional engineers reading this article are aware that in 2017 there was an attempt to eliminate the mandatory professional development requirement for professional engineers licensed in Maine. There was a very effective, concerted, and ultimately successful campaign to retain the professional development requirement made by professional engineering societies.

I have agreed to provide some commentary on mandating professional development. While the issue is settled for Maine professional engineers for the foreseeable future, I have volunteered to present the arguments and opposing arguments presented to the legislature and at the Board for the elucidation of all professional engineers licensed in Maine.

Before attempting this endeavor, I should admit that my willingness to undertake this endeavor may not have been a wise offer on my part since the topic is often divisive. I am reminded of the caveat about killing the messenger when presenting unwelcome information or points of view. Nevertheless, having promised to do so, I shall do my best to present both sides of the issue.

Arguments For

Those advocating mandatory professional development point out the irrefutable and I believe uncontroversial fact that a professional education is both good and necessary for an engineer. Therefore, more education can only benefit the profession, the public, and the individual engineer. The advances made in engineering research, knowledge, software, and technology are staggering. The professional engineer who fails to learn and keep abreast of these advances does their employer, client, and public a disservice, and some might argue would perhaps amount to misfeasance or nonfeasance.

Mandating professional development after licensure forces professional engineers to upgrade their skills and knowledge or get out of the profession. Every engineer can probably think of at least one professional engineer that has allowed their knowledge or skills to stagnate or would stagnate but for mandatory professional development requirements.

Seminars, workshops, and other forms of mandatory education expose professional engineers to new technology, procedures, and software. There is no engineering discipline that does not benefit from research, emerging technology, new knowledge, innovative procedures, or software. Mandating professional development assures the widespread, consistent, and rapid dissemination of new ideas and knowledge.

Furthermore, mandating professional development instills public confidence that a professional engineer's knowledge will remain current. The public perception regarding the competence of the engineering profession is an important aspect to be preserved and enhanced.

Many professional engineers will admit they are competent and would remain competent without a mandate; yet these same engineers will advocate the need for the mandate to coerce frugal employers to set aside time and money for their professional development. In some cases, the individual engineer acknowledges that the mandate coerces them to participate in extra education; admitting they would otherwise lack motivation to do so – much like an alarm clock moves the reluctant individual to end their sleep and start their work day.

Mandatory Professional Development

By Knud E. Hermansen, PE, PLS, PhD, Esq.

Arguments Opposed

Those professional engineers opposed to the requirement for professional development frequently make the point that they are opposed to the actual mandate for professional development, not the need to continue to expand an engineer's education, which they readily admit.

Those engineers denouncing the mandate point to the illogic of mandating a profession. How can a professional engineer claim to be a professional and able to competently design and make important decisions on the client's behalf, often involving millions of dollars, yet be incapable of deciding for themselves how and when they should pursue further education? Put in other words, should a professional engineer that cannot be trusted to self-motivate to pursue activities necessary to remain competent be allowed to practice professional engineering without supervision?

Those opposed to mandating professional development argue that mandating professional development was never necessary and has not been effective. Complaints involving actual deficient practice based on inadequate professional knowledge or education are non-existent or rare. To require 100% of the professional engineer population to be bound by regulations that attempt to alleviate a possible problem that may be present in less than 1% of the licensed engineering population is absurd.

Furthermore, where mandating professional development has been instituted and repealed, there is no data suggesting that mandating professional development has reduced the number of valid complaints.² Like so many government regulations the costs, frustration, and difficulty of the regulations exceed the benefits intended by the regulations.

Accepting for the sake of argument that mandating the continuation of education has benefits for a professional engineer, knowledgeable educators have warned against imposing typical education programs upon adult professionals.³ The typical mandatory professional development scheme is repugnant both as a professional and as an adult.⁴

Indeed, adult education specialists are quick to state if asked that compulsory professional development in a structured education setting violates most adult learning principles.⁵ Whereas adult learning principles stress giving the learner independence in choosing their education and self-motivation toward learning, mandating professional development does just the opposite. Rather than be the directors of their own learning processes, mandatory professional development shifts many decisions regarding the individual's education needs and best learning practices to a government agency or a series of inflexible rules.⁶ Studies have shown that where there is a failure to abide by adult learning principles there is great risk of ineffective, costly, and unprofessional education.⁷

For example, the professional engineer that is the principal of a large engineering consulting firm often finds supplemental education in business, accounting, labor law, or employment law to be most beneficial to their engineering practice, yet these topic areas would not be accepted in many states to satisfy minimum profes-

Professional Development (cont.)

sional development credits for the professional engineer.

An adult learner will often learn a great deal of new and innovative engineering by talking one-on-one with another professional engineer in regard to a specific project. This effective and typical adult learning activity would not be allowed to satisfy mandatory professional development requirements.

Forcing adults and professionals into specific forms of learning environment is seldom effective.⁸ Most people attend seminars on subjects they enjoy and are familiar with already. Professionals usually attend seminars not so much to learn something they do not know; rather, they attend seminars to reinforce their belief that what they do and how they currently practice is correct. If a speaker lectures contrary to the listener's belief or practice, the typical listener presumes the speaker is not competent and is wrong rather than the opposite being true.

Second, educators are well aware that when people are forced to attend classes, many people show their displeasure or lack of interest by turning off to the speaker. That person attending the seminar day-dreams, sleeps, or simply fails to pay attention. Unfortunately, the same non-caring attitude that causes a professional to practice haphazardly or not keep pace with emerging technology also causes them to listen and learn haphazardly when put in a situation where they could learn should they choose to do so. (This argument follows the old saying, "you can lead a horse to water but you can't make it drink.")

Of course, colleges and schools have known this fact since the dawn of formal education. Educators in these settings require specific courses, exams, homework, and papers to force study and understanding in a field of study. Consequently, mandatory professional development could be effective but only where specific seminars are mandated and the seminars include passing exam grades to receive credit or where there is periodic re-testing for continued licensure. How many advocates for mandatory professional development would continue their advocacy for mandatory professional development if they had to periodically take the professional engineer exam again or take an exam to get credit for attending a seminar?

The professional engineer that benefits the most from a structured learning environment is an engineer that wants to attend and would ordinarily attend without compulsion. In other words, mandating the attendance is not necessary.

Conclusion

This completes the arguments for and against mandating professional development. I have attempted to present both sides using common and relevant arguments for and against mandatory professional development.

In closing, I will state that the Board of Licensure has the duty to protect the public. It strives to do so effectively with minimum burdensome regulation imposed on the professional engineer. The Board of Licensure always welcomes input from the public, engineering professional societies, and individual engineers. Should you wish "to shoot the messenger," I would welcome all comments. You can address emails to me through the board email at: professional.engineers@maine.gov.

Professional Development (cont.)

1 As Morrison, an adult education specialist, stated: “The very fact of being relatively self-directed and trusted to make competent decisions affecting their clients, the professional ought to resist the imposition of compulsory education.” Morrison, A.A., “Resisting Compulsory Continuing Professional Education,” *Australian Journal of Adult and Community Education*, Vol. 32, No. 3, p. 147 (Nov. 1992)

2 In Illinois where mandatory professional development was made effective and later repealed for physicians, most physicians reported the implementation and repeal had no effect on their patient care. Little, Chloe, “Mandatory Professional development: A Survey of the Literature and a Comment on the Implications for Physical Therapy,” *Journal of Professional development in the Health Professions*, Vol. 13, pp. 159-167 (1993)
The incidence of malpractice suits stayed the same. Little, Chloe, “Mandatory Professional development: A Survey of the Literature and a Comment on the Implications for Physical Therapy,” *Journal of Professional development in the Health Professions*, Vol. 13, pp. 159-167 (1993) p. 3

3 Vannozi, A. Richard, P.L.S., M.S., thesis *The Effect of Mandatory Continuing Education on Practice Quality and Competency of Professional Land Surveyors* (2006), <https://digitalcommons.library.umaine.edu/etd/430/>
Also see, Morrison, A.A., “Resisting Compulsory Continuing Professional Education,” *Australian Journal of Adult and Community Education*, Vol. 32, No. 3, p. 146 (Nov. 1992)

4 Vannozi, A. Richard, P.L.S., M.S., thesis *The Effect of Mandatory Continuing Education on Practice Quality and Competency of Professional Land Surveyors* (2006), <https://digitalcommons.library.umaine.edu/etd/430/>
Also see, Morrison, A.A., “Resisting Compulsory Continuing Professional Education,” *Australian Journal of Adult and Community Education*, Vol. 32, No. 3, p. 146 (Nov. 1992) p. 2

5 Vannozi, A. Richard, P.L.S., M.S., thesis *The Effect of Mandatory Continuing Education on Practice Quality and Competency of Professional Land Surveyors* (2006), <https://digitalcommons.library.umaine.edu/etd/430/>

6 Kerka, Sandra, “Mandatory Professional development,” *ERIC Digest No. 151* 1994

7 Morrison, A.A., “Resisting Compulsory Continuing Professional Education,” *Australian Journal of Adult and Community Education*, Vol. 32, No. 3, p. 147 (Nov. 1992)

8 Vannozi, A. Richard, P.L.S., M.S., thesis *The Effect of Mandatory Continuing Education on Practice Quality and Competency of Professional Land Surveyors* (2006), <https://digitalcommons.library.umaine.edu/etd/430/>

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