

I. Source

NAE publication: Summer Issue of The Bridge on Undergraduate Engineering Education, vol 2(2), 2013 by Rick Stephens

II. Credibility of Source

NAE is a respected and credible source of information. There are five references but only one cites a scientific study. The rest are from articles by journalists. The statistics cited are not national but better than single anecdotes. Rick Stephens retired in March from the Boeing Company as Senior Vice President of Human Resources and Administration.

III. Summary of Content and Conclusions

Another affirmation for the needs for soft skills: "Today's engineers need to be not only technically strong but also creative and able to work well in teams, communicate effectively, and create products that are useful in the 'real world.'" There are few reports that students lack the technical skills they need. Failure to succeed is mostly due to deficits in soft skills. Stephens recommendations to enhance soft skills are:

- a) *Assignment of New Students to Cohorts*
- b) *Engineering Professors Teaching Mathematics and Physics*
- c) *First- and Second-Year Engineering Student Projects*
- d) *Internships*

"The four measures described above are just a sampling of options, but colleges and universities where engineering school leaders and faculty have implemented them (or measures similar to them) have seen steady increases in student retention and graduation rates. For example, at Duke, Columbia, Olin, and the University of Southern California, 85 percent of entering engineering students graduate with engineering degrees—a dramatic improvement over the figures cited in the New York Times article (Drew 2011)."

IV. Relevance to the Department of ECE

All of this article seems relevant, it seems to me. The Department may already be doing the equivalent of these recommendations particularly (c) and (d). (b) may be contentious within the university environment.

V. Recommendations for the Department or the IAB

An alternative approach to (b) might be to meet with the math and physics departments and request that they offer introductory courses

geared specifically to engineers with lots of engineering examples and applications. Perhaps Board members could be recruited to teach such courses as a way to attract students. (a) should be considered. IAB members could contribute significantly to b,c and d, especially (d). Whether the department accepts the premise of this article (it's all a matter of soft skills) or not, I would recommend that the Department rigorously track the number of industry internships offered and accepted and the graduation rates of ECE students, investigate trends at least annually and respond.

VI. Contact Information

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The full article can be found here:

<http://www.nae.edu/Publications/Bridge/81221/81233.aspx>