

An Insight into Viable Engineering Education and Social Responsibility towards Sustainable Development

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ABSTRACT

Nowadays environmental footprints are talks of the town. Few developed countries are trying to avoid their responsibilities while teaching lessons of sustainable development to developing and underdeveloped countries. In this entire context, it is important to teach the importance of sustainable development to students. Also the viability of engineering education from industrial requirement point of view needs to be assessed. There is need to have education system for engineering students which can encourage students for developing conception and visualization. Alignment between classroom teaching and actual practice is most important aspect.

Key words: Engineering organizations, framework, responsibility, sustainability competencies.

INTRODUCTION

Engineering education needs to be modified and restructured to fulfil needs of the industry. While striving for growth and excellence, there is need to put additional emphasis on moral and character building.^[1,2] It should be noted that the engineering education is a part of very large educational reforms aimed at providing efficient man power for nation building.

Nowadays environmental footprints are talks of the town.^[3] Few developed countries are trying to avoid their responsibilities while teaching lessons of sustainable development to developing and underdeveloped countries. In this entire context, it is important to teach the importance of sustainable development to students. Also the viability of engineering education from industrial requirement point

of view needs to be assessed. Current review provides insight into engineering education, ethics and social responsibility towards sustainable development. Proper understanding of ethical responsibilities needs to be taken care of more predominantly. This awareness about environment and social responsibility should be cultivated in the mind of youngsters from pre-engineering days.

AN INSIGHT INTO ENGINEERING EDUCATION, ETHICS AND SOCIAL RESPONSIBILITY TOWARDS SUSTAINABLE DEVELOPMENT

Litzinger discussed engineering education in detail.^[4] According to them, there is need to have education system for engineering students which can encourage students for developing conception and visualization. They felt need for alignment between classroom teaching and actual practice. Daily et. al. presented a framework for understanding involvement in student-run engineering organizations.^[5] According to them, fund generation through involvement in student-run engineering organizations can have positive impact on overall success of students and their retention. This study was related to African educational system. Tucker and Ferguson discussed ways to incorporate ethics and social responsibility in undergraduate engineering education.^[6] They highlighted need for increasing the numbers and the involvement of women and under-represented minorities in engineering. They carried out pre- and post-semester survey of students in engineering course. Their survey incorporated ethics and social responsibility to a greater or lesser degree.

Tran and Nathan examined the relationship between student enrolment in a pre-college engineering course and science achievement for high school students. [7] Allen and Shonnard discussed sustainability in chemical engineering education. [8] Sustainability according to Brundtland Commission report is development that meets the needs of the present generation without compromising the ability of future generations to meet their needs. According to them, knowledge outside of our discipline, and also working with outside experts, will be necessary to achieve sustainable chemical engineering.

Kelly discussed the engineering education for sustainable development. [9] He emphasized need for integration of tertiary-level engineering education into strategies for achieving the sustainable development. The imparting of engineering science education is very important. Scholarships to send students to developed countries for engineering education are short term solution. It is necessary build capacity at the country level is necessary for education and research.

Studies on information and communication technologies (ICT) and student performance in higher education were carried out by Youssef and Dahmani. [10] According to them, economic research has failed to provide a clear consensus on the effect of ICT investments on student's achievement. They emphasized that student's characteristics, educational environment and teachers' characteristics are important factors in a student's performance. Their study also indicated need for a change in the organization of higher education. Byrne et. al. reviewed international progress on engineering education and sustainable development. [11] They reviewed accreditation developments, highlighting emerging sustainability competencies in the institutes with regard to initiatives, policies, and codes of ethics and guideline publications. Farrell et. al. Discussed impact of higher education on society. [12] Their studies provided account

of the benefits of the higher education to the society with some concrete evidences. The major challenge for universities, according to them, lies in imparting the ability to generate new ideas.

Hynes and Swenson expressed need for a more systematic inclusion of social science and humanities knowledge in engineering at all levels. [13] According to them, attitudes, beliefs, and perceptions shift are important elements in research towards making engineering education more responsible and socially relevant. Anderson and Boyles discussed future impact of engineering education on society. [13] Their study indicated that online education system can boost competitiveness of engineering education.

CONCLUSION

According to Litzinger, there is need to have education system for engineering students which can encourage students for developing conception and visualization. Alignment between classroom teaching and actual practice is most important aspect. According to Allen and Shonnard, knowledge outside of our discipline, and also working with outside experts, will be necessary to achieve sustainable chemical engineering.

REFERENCES

1. Sunil Jayant Kulkarni, "Challenges in Engineering Profession and Education: Ethics, Practices and Evaluation", *International Journal of Research*, 2015, 2(4), 780-783.
2. William T. Lynch and Ronald Kline, "Science, Technology & Human Values", *Science, Technology, & Human Values*, 2000, 25(2), 195-225.
3. Dr. Cynthia J. Finelli, Ms. Kenyon M Richardson, Dr. Shanna R. Daly, "Factors that Influence Faculty Motivation to Adopt Effective Teaching Practices in Engineering", 120th ASEE Annual Conference and Exposition, Frankly, 2013, 1, 1-11.
4. Thomasa. Litzinger, Lisar. Lattuca, Rogerg. Hadgrafa, Andwendy C. Newstetter, "Engineering Education

- And The Development Of Expertise”, *Journal Of Engineering Education*, January 2011, 100(1), 123–150.
5. Shaundra Bryant Daily, Wanda Eugene, Anderson D. Prewitt, “The Development Of Social Capital In Engineering Education To Improve Student Retention”, 2007 Asee Southeast Section Conference, 2007,1,1-8.
 6. Jessica Tucker And David Ferguson, “Incorporating Ethics And Social Responsibility In Undergraduate Engineering Education”, *International Conference On Engineering Education – Icee 2007*, September 3 – 7, 2007,1-6.
 7. Natalie A. Tran, Mitchell J. Nathan, “The Effects Of Pre-Engineering Studies On Mathematics And Science Achievement For High School Students”, *Int. J. Engng Ed.*, 2010, 26 (5), 1049–1060.
 8. David T. Allen And David R. Shonnard, “Sustainability In Chemical Engineering Education: Identifying A Core Body Of Knowledge”, *Aiche Journal*, ‘Accepted Article’, Doi: 10.1002/Aic.13877,2012, 1-13.
 9. W.E Kelly, “Engineering Education For Sustainable Development”, *George Mason University, Fairfax, VA, Brief For Gsdr - 2016 Update*,1-3.
 10. Adel Ben Youssef, Mounir Dahmani, “The Impact Of Ict On Student Performance In Higher Education: Direct Effects, Indirect Effects And Organisational Change”, *Monograph The Economics Of E-Learning*, Rusc, 2008,5(1), 45-56.
 11. Edmond Byrne, Chery Desha, John Fitzpatrick And KarlsonHargroves, “Engineering Education For Sustainable Development: A Review Of International Progress”, 3rd International Symposium For Engineering Education, University College Cork, Ireland, 2010, 1, 1-42.
 12. O'carroll, C., Harmon, Colm, Farrell, Lisa, “The Economic And Social Impact Of Higher Education”, *Irish Universities Association*,2006, 1, 1-32.
 13. Morgan Hynes, Jessica Swenson, “The Humanistic Side Of Engineering: Considering Social Science And Humanities Dimensions Of Engineering In Education And Research”, *Journal Of Pre-College Engineering Education Research (J-Peer)*, 2013, 3(2), Article 4, 31-43.
 14. Janna Quitney Anderson, Jan Lauren Boyles, “The Future Impact Of The Internet On Higher Education: Experts Expect More-Efficient Collaborative Environments And New Grading Schemes; They Worry About Massive Online Courses, The Shift Away From On-Campus Life”, *Pew Research Center’s Internet & American Life Project An Initiative Of The Pew Research Center*,2012,1,1-43.

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