

Language Proficiency of the Global Engineer - A Time To Redesign

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Abstract

Language got multifaceted usage which changes with times. In today's global world different kinds of jobs with varied aims and objectives, are demanding diversified language skills from the aspirants. With this backdrop, the course structure of different courses, needs to be designed with innovative pedagogical frame work, which should necessarily cater to the needs of the learners.

This paper deals with the qualities of global engineers and the current status of language in the engineering courses with a special focus on the student's mindset towards improvement of language proficiency. It is highlighted here that 'To meet the expectations of the industry, learner should strengthen the employability skills.' Finally, this study highlights the reforms required in the engineering education and stresses that 'the success and future of global engineer is dependent on their communicative competence.'

Introduction:

In the present day global village, English is transforming in many ways according to the needs of the user. When the entire world is stepping ahead to the technological forefront, obviously English should undergo certain changes to adapt the new trends. At present, engineering education is undergoing drastic changes rather than the yester years.' The enormous growth of IT sector forced the engineering stream to absorb new branches like computer science engineering, Information technology etc. Prior to IT boom, engineering education is confined to only constructive things which has slowly changed its definition and dimension , once the computer revolution came into existence. When the computers started invading all fields, suddenly necessity arose for the education sectors to modify their curriculum and to bring pedagogical changes in the structure of different courses.

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The Origin

The first engineering degrees in the US (West Point and Rensselaer Polytechnic, 1835) were based on the 18th century view of engineering as a blend of the arts, meant to create artifacts and systems to serve society. If observed, the words *engine* and *engineer* (as well as *ingenious*) developed in parallel from the Latin root *ingenious*, meaning "skilled." An engineer is thus implied to be a clever, practical practitioner, and designer. This clearly states that skilled engineer should be strengthened in a multi-faceted way. The word *engineer* was first used in 1325 AD. Engineering was originally divided into two branches: military engineering and civil engineering and has added many new streams of study later. However, the increase in the sophistication of engineering and technology presents new challenges to engineering colleges and educators.

English in Engineering Stream - A Look Back

Two decades before, students opting for Engineering education used to be very less in number. Moreover, Engineering curriculum was rooted deep into technical subjects where the emphasis in language was significantly less. But, in general, students joining in Engineering stream used to be the creamy layer who were the toppers in their respective institutions or at the regional level, district level, etc. Naturally, they used to strive hard to speak in English to keep their identity in the group.

Another finding is that most of the students used to study in the vernacular medium up to schooling or up to +2 level. After joining in the professional college, all engineering subjects were taught in English. To understand the subjects and difficult concepts, proficiency in the English language was a 'must' in those days. Further, Students used to feel shy and degraded if they were unable to express in English. All the faculty members used to interact with students in the campus only in English during college hours.

Further, though there was no specific emphasis on spoken English, the student of engineering was expected to talk good English. Here an interesting point noted down from the

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engineers of the yester years is that technical students apart from their subjects used to give importance to language learning. As the other sources of entertainment like movies, television were not widely available, most of the students used to read fiction to pass the time. This reading enabled them to have more command on the language. Though there was less priority for spoken language, people used to struggle and tried hard to speak good English. Written skills of these engineering students were up to the mark. They used to do good drafting. Drafting of official letters, sending reports and communicating with the colleagues was well designed (with acknowledgement to Dr. L.S. Gupta, Director Academics, Godavari Institute of Engineering and Technology, Rajahmundry, A.P.)

Contrary to this, the present generation of Engineers is lacking in a lot in skills. In the past two decades, the scenario changed upside down. The mushrooming growth of Engineering colleges brought the policy of “demand and supply” into existence. Further, government policies to extend financial support to students from economically backward class students also facilitated more number of deserving candidates from the lower income groups to look for engineering option. These formulae with their feasibilities made the average student also to opt for technical education. As the colleges increased in number, so the increase in the number of seats which obviously created more demand for faculty members. This factor also contributed for the dual benefit of both the managements and the faculty. The choice was more for both the sectors. But slowly the standard of the inputs (students) became lower than the previous batches comparatively, where even their language skills were also poor. One should observe that contrary to the earlier generation where majority of the students were from vernacular medium, the entire schooling of a good number of students of the present generations is being completed in English medium only. But it is a very pathetic fact that even this English medium background is not providing the students with required spoken skills, when they start professional studies.

Impact of Schooling on Language Learning:

With the voluminous growth in the number of schools, unfortunately there lack of quality in instruction and achievement and this calls for immediate attention. Though there is a tremendous growth in the number of schools because of the privatization of education sector.

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There is great demand for enrollment in the engineering and medicine disciplines. To keep maintain their level of enrollment, most corporate schools highlight the training they impart to the students along with regular curriculum. This foundation enables their students to do well for the Engineering Entrance examination like IITJEE, BITSAT, and AIEEE, etc. In most of the schools a special orientation for mathematics, physics and chemistry is given. Due to the overload of the content to be dumped into the young mind of 13-15 years old student, the school authorities search for alternatives to reduce the burden. Naturally, it forces the community to demand for reduction in classroom teaching time. In this process, it appears that the emphasis given to language learning and also weightage given for language get considerably reduced. This is creating a lot of chaos in the students' mind. Negligence towards language learning makes a child to lose basic skills like narrative techniques, describing and explaining skill, etc. They pause and look for words and feel confused even to speak in native language. The process of losing skills in the native language in turn also affects the basic language learning capacity of the learner seriously. As per the Indian Government's Three Language Formula, in most of the states apart from the native language, English will be the next dominating language. The emphasis for the Official Language declared by the Constitution of India is comparatively much less. The introduction of second and third languages varies from school to school, board to board and even between states.

Struggle of Engineering Students in the Acquisition of Language Proficiency

Either to pursue higher studies at the Masters' level or to build excellent career, the strong and effective tool of English language is necessary for the budding engineers. The MNCs are providing the young engineers to reach the global level but they all need to possess efficiency in handling all aspects of their duties in MNCs. The Language Proficiency, neglected for years, does not come to the rescue of the candidate in the times of critical negotiations. This is forcing them to look back and repent for their negligence. Engineering students as adult learners are forced to spend extra money and time to reach acceptance levels.

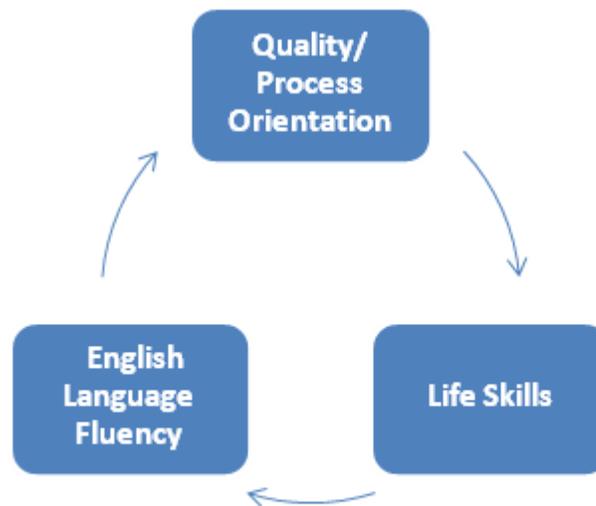
Some of the employability skills expected from today's engineer are 'Fluency in English Language, Comprehension, Articulation, Persuasion, Written & Oral Communication, Essay

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Writing, writing Technical Papers, writing Technical Reports, etc. Language teaching now includes teaching other Life Skills like Communication Skills, Team Building, Decision-making, Corporate Ethics and Etiquette, Time Management, Customer Interaction, Goal Setting, Crisis Management, etc. It also demands that the language teacher change accordingly. ‘Worldwide, there is an urgent need to make engineering education more relevant, exciting and intellectually rigorous. The effectiveness of teaching impacts not only what is actually learned but also the quality of the people attracted into the profession.’ (Devika, 2007). One should acquire all the required Employability competencies like Problem Solving in the context of societal needs, Creating/Using Technologies and Tools for Local/ global needs, etc.



Expectations of a Global Engineer

There is a dire need for a large number of Global Engineers for a Global Workplace in the emerging trend. Global competence is the key qualification of engineering graduates. This is a very harsh fact that out of total engineering graduates coming out each year, only 20-30% are Employable or Trainable. When they are doing the professional courses like Engineering they are expected to acquire certain essential qualities like technical knowledge with hands on experience, good communicative competence along with a command on core competencies and good awareness of importance of soft skills, etc. As engineers are supposed to integrate into any Organization as Peers, Managers, juniors, Customers and Partners they should understand the

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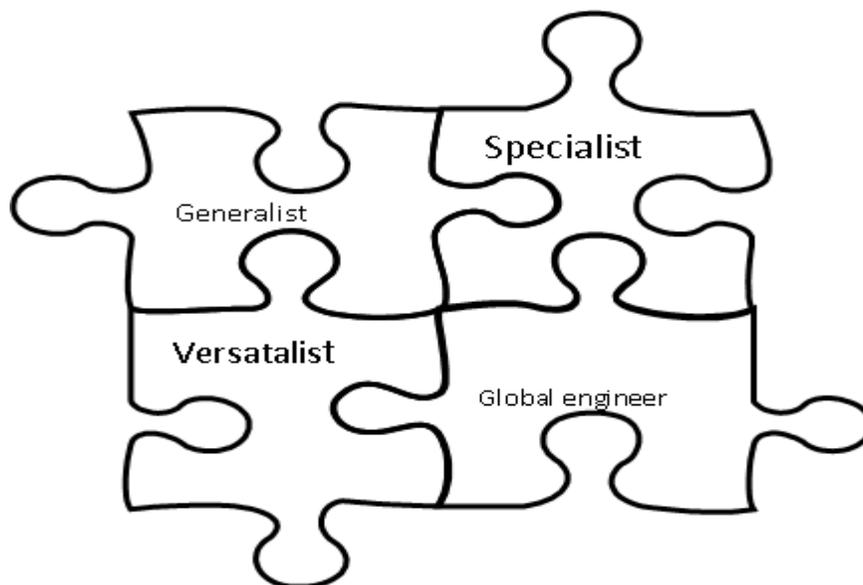
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pre-requisites of their job. They should adapt to Corporate Work Culture and should be ready to work in Multi-cultural Virtual Teams.

In addition to these features, synthesizing the creative technical solutions to solve business problems is also required. To achieve the said goals, a professional business model is necessary in education to get the alignment of industry and education sector. When soft skills become part of the personality grooming, such attainment gives some hints of one's personality, and so these skills should be accommodated well into the academic training. As the use of soft skills reveals one's understanding power in various policy matters and in decision-making, the soft skills segment alone, with a stress on communicative English is now sought after as essential commodities of corporate training. This has only raised the curtains for the new concept of 'finishing school'.

Different Roles Expected of an Engineer

The following figure shows the different roles expected of an engineer, with multifaceted knowledge and growth opportunities, to reach global level.



If we look into the expectations of a global engineer, the following will be emphasized:

Logical thinking: the ability to make logical decisions.

Problem-solving skills: the ability to resolve issues, problems and tasks.

Communication skills: the ability to exchange information with other people in the organization and the community.

Design skills: the ability to sketch, plan and work out designs creatively.

Organisational, management and administrative

Skills: the ability to organize effectively; the ability to coordinate, supervise and manage.

(Duyen Q. Nguyen)

Hence it clearly indicates that understanding the latest trends, more research on engineering education in a global context is the urgent need of the hour to prepare the world class engineering students in the Indian context. These highlight the areas and the competency levels of the global student to be strengthened when they need to move across the world to deal with overseas assignments, interacting with international delegates and clients. Apart from these, if we look into the successful Attributes of the Engineer they demand certain qualities. One should have strong analytical skills, exhibit practical ingenuity and possess creativity. Further, good communication skills to maintain rapport with multiple stakeholders, business and management skills, leadership abilities are also pre-requisites along with high ethical standards and a strong sense of professionalism.

Global engineering excellence depends critically on specific skills and multifaceted knowledge especially for those who link up engineering education to professional practice. Flexibility to work in global work culture and adaptability for transnational mobility has become a top priority. Candidates should be dynamic and flexible and should have the basic zeal to learn. To this the “Ability to face challenges and handling the men and matters tactfully” becomes an added feature. All these skills can be handled easily by the language teachers also as they can develop more closer rapport with the learners in general.

Employability Skills

India still produces plenty of engineers, but their competence has become an issue. It is found that only a countable number of engineering graduates are fit to be employable. For the rest, their technical skills are deficient, their English-language abilities are below par or they have not been taught how to work in a team or deliver a basic oral presentation. It should be understood that numbers are important, but it is really about skills which make the difference.

Some Parameters

Engineering curriculum should be broad and flexible, preparing students for leadership and specialist roles in a variety of career areas. Each curriculum should be designed to produce graduates who are life-long learners and contributors to the profession, fully capable of succeeding in a global, multi-disciplinary marketplace. The learning experiences should accommodate students with various learning styles as well as different cultural, ethnic, class, gender, age and racial backgrounds. The skills employers expect from the budding engineers include the following parameters;

1. Communication and interpersonal skills
2. Problem solving skills
3. Using initiative and being self-motivated
4. Working under pressure
5. Organisational skills
6. Team working
7. Ability to learn and adapt
8. Numeracy
9. Valuing diversity and difference
10. Negotiation skills

(Source: www.nationalstemcentre.org)

But at present, in the engineering courses all these skills are neglected, bringing down the standards of the course structure. A specific training in soft skills and curriculum based language teaching is required to make them industry ready. If the products are ready to use and possess all the required skills then industry would surely come forward to choose the future employees from the academic institutes.

The Reforms Required in Engineering Education

‘How to reform engineering education to address the challenges of local needs and globalized world?’ is the question before the nation to build up a very strong ‘future engineering force’. The time has come for the Indian academic and research institutes to look into and take up a serious study to make the engineering curriculum with a more practical approach and of global standards. “Re-engineering the engineering education system” is the urgent need of the hour. It should inculcate the concept of engineering with an aim to serve the society. As the product shaping and nurturing mainly depends on efficient faculty, institutes should be conscious and careful while choosing the dedicated and committed teachers who are knowledgeable and student friendly. New standards for faculty qualifications, experience and expectations should be created. For example, industry experience along with academic qualifications, of teaching faculty moulds the students as “practicing engineer” of the present day world.

In addition to content delivery, engineering colleges must teach students how to learn, and must work with professional associations in facilitating lifelong learning of the students. Experts view that “Research into engineering education should be recognized as a valued and rewarding activity for engineering faculty.” Innovating and reforming the engineering education to respond better to local and global challenges is very much required. To Implement and enhance quality assurance, accreditation mechanisms along with transformation of education for growth and development, should also be considered.

When we want to improve the qualities of ‘Engineering Education’ it is needed to increase the pipeline and nurture a new generation of scientists and engineers. There is an urgent requirement to renovate, reform and redesign the engineering curriculum and turn the curriculum

inside out with an objective to use experiential education to build models for continuous and career-long learning. One should remember that Students are central to the educational process. They should be active participants in the educational transformation process. The educational experience should also develop the motivation, capability, and knowledge base for lifelong learning in the students. Teaching Faculty needs to assume a more active role not only in the content delivery but should strive to give the students a hands on experience to make the student worthy of facing global challenges and expectations . Changes in recruitment, assessment, and the reward structure of the teaching faculty which are most essential for encouraging faculty, becomes an added point of urgent necessity in the path of redefining the objectives of engineering education to get the expected quality improvement.

Future of Engineering Education

If one takes a glimpse of what the industry and the society expect of a student who graduates with an engineering degree, a professional touch (in whatever they handle) is lacking in today's engineering student. They must be capable of integrating knowledge from a variety of disciplines and working with industry partners to advance that knowledge into innovations.

They will need to know the human and social dimensions of technology; for example, how technology can be shaped to suit common man's needs, as well as the parameters of decision-making. Our social and economic progress depends upon it. The question how to employ the classroom knowledge and educational system to gain economic advantage in the global economy across the whole value chain, is taking the attention of elite few. Everyone agrees that Science, technology, innovation and education along with potential communication, are the basis for sustained economic development in both developed and emerging economies..

One of the characteristic features of a future engineer, according to Joseph Bordogna (2003) is that the engineer will need to know the human and social dimensions of technology; for example, how technology can be shaped to suit our needs, as well as the parameters of decision-making. Our social and economic progress depends upon it. They should “Communicate ideas effectively to influence diverse groups, including non-engineers; act both independently and as a

team member.” Further, the learner should develop the motivation, knowledge base, and intellectual capacity for career-long learning. This fairly demands from him certain qualities like leadership skills, interpersonal skills, time –management, persuading skills etc. Nobody disputes the idea that the demand for talent-intensive skills is rising. But, two things are making it hard for companies to adjust i.e. Loyalty and ‘Mismatch between what is produced and what is needed . It is observed that “ We need to educate our engineers beyond their technical expertise. The best technical training must be combined with understanding how that expertise fits into the larger societal environment, into our overriding national goals, and indeed, into the goals of other nations.” (Retrieved from www.nationalstemcentre.org.uk)

Conclusion

The next generation Engineering graduates should understand the functional core of the engineering process. They should be in a position to analyze and synthesize; formulate problems and solve them; become adept at group problem-solving strategies, and they should be able to recognize the relationship of the engineering enterprise to the social, economic context of engineering practice and the key role of this context in engineering decisions.

Then the words of Winston Churchill, “The empires of the future will be empires of the mind” will be realized and the new technological growth happens with the young competent, challenging engineers.

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