

## **Influence of High Impact Teaching Skills on the Teaching - Learning Process in Engineering Education**

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### **Abstract**

Teaching in higher education institutions is becoming more and more critical and intricate with each new generation of students entering the portals of higher education. Academic Staff College at VIT University, from time to time, has been organizing a range of training programmes and faculty empowerment workshops for its faculty, newly recruited and faculty who are already serving. During the training sessions, it has been observed that there are some specific soft skills desired to be possessed by engineering teachers, in addition to their disciplinary knowledge and subject matter expertise. These skills are: creating a positive impression, simplifying complex information, use of analogies, communicating with greater impact, responding to difficult class room situations and inspiring peers and students to embrace change. In addition, generic communication skills such as use of appropriate body language and gestures, confidence, presentation of information in a logical and methodical manner, showing empathy and concern and listening skills are also required for engineering teachers. The authors have designed and implemented a model in a training environment to impart these soft skills and training in a comprehensive manner. The training methodology adopted, analysis of the observations made, the key learnings and the challenges that lie ahead for the successful development of soft skills amongst the engineering educators and teacher trainers are presented in this paper.

**Keywords:** engineering education, training, soft skills, communication skills, using analogies, class room situations, inspiring to embrace change.

### **1.0 Introduction**

For engineering educators and teachers, there exists, just like technical skills or “hard” skills, a corresponding set of “soft” skills. These soft skills are a collection of methods and techniques by which an engineering teacher can influence the behaviour of his students in a way that enhances his enlightened self-interest. Soft skills enable the building of alliances with the learners with the appropriate amount of trust. Barry Blesser (2009) cites that soft skills reveal the degree to which points of discussion align or conflict. In management education, negotiation techniques are considered as soft skills. Similarly, in human resources management, conflict resolution is a soft skill. For supervisors and shop managers motivating co-workers is a soft skill. Soft skills enable us to function at highest level when dealing with people and organizations. Effective leaders have a tool box of soft skills that induces others who want to follow them. With inadequate soft skills, hard skills (or) technical skills are rarely

sufficient by themselves to produce professional success. The most productive professionals have an equal balance of hard and soft skills.

Engineering teachers are expected to interact with many people, students, faculty colleagues, doctoral guides, mentors, members of industry groups and society at large. Their interaction is primarily, in the initial stages of their career, with students groups, but to build professional competencies, to raise to higher level positions in the University environment, and for interactions with people in complex groups soft skills are a must. Generally it is found that engineers and engineering educators avoid situations requiring such soft skills.

## **2.0 Training Sessions and Modules:**

Academic Staff College of VIT University organized many Faculty Empowerment Workshops titled “High Impact Teaching Skills”. About 250 faculty members from engineering disciplines have undergone the training programmes offered through several workshops. The training programme duration is 2 days (four half-day sessions; 16 hours of training) and the batch size is about 30. The participants were faculty members drawn from different schools of engineering of the University.

The Training Programme involves 5 modules with the titles: Creating a Positive Impression, Simplifying Complex Information, Communicating with Greater Impact, Responding to Difficult Classroom Situations, and Inspiring Peers and Students to Embrace Change.

The modules of High Impact Teaching Skills are essentially to improve the soft skills of the faculty rather than the hard skills of their disciplinary or technical skills. Often the performance of the participants is inter related with the motivation level of the individual and the extent of response of the listeners. It is not easy to measure the outcome of softskills training since it varies depending on many relevant factors.

An individual’s mastery or proficiency in a skill is critical to successful training transfer. (Laker & Powell 2011) Because of many complexities, the hard-skill trainee is more likely to leave the training setting with a greater degree of proficiency or mastery than an individual who has received some soft-skill training. Hard skills and soft skills are not mutually exclusive but complement each other (Blessner 2009). In combination hard skills and soft skills are infinitely more productive than either alone. Soft skills never become obsolete. People remain people.

Each training module is designed as a half-day small group presentation. Each faculty gives a presentation. The presentations were video graphed. Oral feedback was obtained from other faculty members from the peer group. Trainer has made his own observations on the Proforma developed (Appendix 1). The video was re-played and one-to-one feedback was given to the individual faculty. An analysis of the soft skills training programme we conducted is presented here. Certain parameters have been chosen to ensure that this training would enhance the stage/public presence of the teacher in the class room. The training sessions are explained as follows:

## **3.0 The Modules**

### **3.1 Training Session 1: Creating a Positive Impression through Managing Oneself:**

According to management expert Peter (Drucker 1999) we will have to learn to take responsibility for managing ourselves. Perhaps, this is probably a much bigger responsibility than managing any technological change, a change in the human condition. Nobody teaches it, neither in the school, nor in the college. We will have to learn where we belong, what our strengths are, what we have to know so that we get the full benefit from it, where our weaknesses are, what we are good at, where we do not belong, what our values are. We build on the strengths we are bestowed with. Social skills in addition to English speaking skill are important as engineers are becoming more and more global citizens in the context of economic globalization. (Hilmer 2007) has identified social skills in addition to soft skills as an important training concept in engineering education. Teachers have to play a positive role in the class room environment. We have to build our power and capacity to influence the students to learn. We have to energize ourself, create a positive impression in the class. Class room is one such place where our full potential is to be realized and brought out.

The emphasis of this session is on providing the faculty with different inputs to help him in the process of finding out his own potential and to enable him to create a positive impression about himself in the class amongst his

learners. This positive impression needs to be created not just on the first day of the semester, but on everyday the faculty engages the class.

The objective of the module is to help faculty members to establish a positive first impression and carefully communicate towards claiming enhanced credibility as faculty members in playing multiple roles as teachers and role models (Appendix 2). Another objective is to help the faculty in developing a better rapport with the listeners while projecting professionalism and competencies.

An understanding begins in the mind of the listener as soon as the faculty begins the conversation/presentation. It is our approach towards the conversation and interaction, that leaves an impression on the mind of the listener and he would choose how to listen based on the understanding and impression he would receive from the speaker.

### 3.2 Training Session 2: Simplifying Complex Information

The objective of the module is to help faculty members to present complex information in a simple and effective manner. Innovation in thought process is required to put across complex information in a simple and understandable way. This module provides the teachers with an opportunity to express the complex engineering concepts and ideas using analogies in an effective manner. The faculty need to know how to simplify and communicate complex information in an interesting manner. Relating to audience at their level and following a logical progression of ideas are the essential elements of this module. Developing an emotional contact with the learners is also equally important in this context when complex engineering concepts are presented and discussed.

### 3.3 Training Session 3: Communicating with Greater Impact

Well known communication expert Paul Watzlawick once made the statement: "It is not possible, not to communicate" (Hillmer 2007) but, what is important is whether such communication is effective and does it make an impact on the listener. The 21<sup>st</sup> century is characterized by a very high pace in communication, through many technological developments and gadgets and almost unlimited possibilities in conveying the information. It is, therefore, important to ensure not only the acceptance but even more so the interpretation of ideas communicated. Some elements of public speech are introduced to the engineering teachers, viz. introduction of the idea followed by proper building up of the idea, with the right sequencing and offering tips on how to obtain a higher performance and greater impact in the class room instructions. We may mention here that engineering faculty are not that much good in public communication. But, they are required to communicate when they take up socially relevant projects and engage in activities related to service to society, which an university is expected to perform. Also, effectiveness of classroom instructions are very often dependent on the art of correct presentation.

The objective of this module is to help faculty members develop overall communication abilities through the use of facial expressions, body language, gestures and voice modulation. (Mehrabian 1972) has opined that 93% of communication happens through non-verbal communication. Demonstrating ownership of unfamiliar material and present a written material in a captivating manner to a varied set of audience as the situation demands is another skill which this module aims at. Faculty members have difficulty in presenting the materials written by others due to barriers in communication that restrict their flexibility. Usually faculty members don't relish the idea of presenting or reading other's written material, but certain academic situations and circumstances call for such a skill.

A faculty member's ability to speak with modulation makes the difference in the way content is received by the learners. The faculty members need to stress certain words to articulate their voice and tone.

This module also helps the faculty members to develop and maintain professional composure under pressure or when they are stressed. It is often found that engineering educators tend to avoid facing conflicting and difficult class room situations.

The ability of a faculty member to communicate clear, concise and positive message is essential for an intellectual connect and personal bonding between the facilitator and the learner. Engage the audience with the ideas and the subject is the essence of this module. This session helps faculty to communicate with competence and confidence. This module also assists in enhancing faculty skills to handle stressful situations. Faculty trainers share some of their difficult and stressful class room situations and how they have responded to it instead of reacting to it.

### 3.4 Training Session 4: Responding to Difficult classroom situations.

Difficult classroom situations which faculty members face should be considered as opportunities and these are to be dealt with in a constructive way. In this session, the faculty realizes his potential strengths and weaknesses in dealing with difficult classroom situations.

The objective of this module is to help faculty members develop and maintain professional composure under pressure or when they are stressed. It is often found that engineering educators tend to avoid facing conflicting and difficult class room situations.

The ability of a faculty member to communicate clear, concise and positive message is essential for an intellectual connect and personal bonding between the facilitator and the learner. Engage the audience with the ideas and the subject is the essence of this module. This session helps faculty to communicate with composure, competence and confidence. This module also assists in enhancing faculty skills to handle stressful situations. Faculty trainees share some of their difficult and stressful class room situations and how they have responded to it instead of reacting to it.

### 3.5 Training Session 5: Inspiring Peers and Students to Embrace Change.

In this session, the emphasis is on highlighting certain aspects of presentation so that the ideas are conveyed in a convincing way. Every teacher is confronted daily with communicative situations with his students, staff, colleagues, research guides and professors, but also friends and family members. The success of a teacher, especially, engineering teacher is therefore strongly linked to his communication abilities and how he inspires his friends, colleagues and students. The building blocks for effective communication in this context are active listening, use of appropriate verbal and non-verbal communication and ability to convince other people after listening to them and considering their views. At times, engineering educators are expected to manage difficult situations, maintaining composure and talk to concerned people inspiring them to adopt a change. This appeal needs to be both logical and emotional. They may also have to hear diverse viewpoints from others.

The objective of this module is to help faculty members develop the ability to logically and emotionally appeal to the audience. This module also stresses the need for presenting information in a logical structure so as to gain the confidence of the audience. There is a need for faculty to sound convincing while they strive to provide evidence to support their arguments for adopting a change.

## 4.0 The Role of the Trainer

In this kind of training, the trainer's role is not limited to delivering the contents of the training sessions in an understandable manner. He has to show examples and demonstrate how to display these skills and at the same time be able to motivate the faculty enough towards consciously practicing these skills acquired in the training when they go back to work in a classroom set up.

During the training sessions relevant inputs and practical tips are provided by the trainers viz the authors, and the group feedback obtained first regarding positive aspects and, later on aspects for which there is scope for improvement. Video recording and playing of the video is done for each presentation by the faculty. After viewing the video, trainer first asks the faculty to give his own opinion/feedback and later offers his comments and aspects that needs to be improved. The proforma filled in at the time of presentation also serves as a basis; the trainer completes the evaluation while observing the video replay. Sample Proforma's filled in is shown in Appendix 1.

High level of motivation is required on the part of the trainer as well so as to enthuse the faculty to strive for better performance in the class room. A significant reason why the impact does not get transferred is that the new methodology would take additional efforts when compared to their earlier practices. How one handles his communication with others has the influence of other factors like time of the day, psychological state of the faculty, his energy and interest levels and motivation of the learners. Sustained and conscious efforts by the

faculty will enhance his effectiveness in the class room. In many aspects of daily work and life of the engineering teacher these soft skill components will generate positive results.

### 5.0 Key Learnings and Challenges

Key learnings and challenges in soft skills training are presented below:

Module	Key Learnings	Challenges
Module-1 Creating Positive First Impression	Establishing a positive impression First Impression is the best impression Establishes credibility and good rapport with the listeners	Is there excitement in the way of communication Is the energy level sufficient
Module-2 Simplifying complex information	Appropriate use of Analogies and examples help in this task	Use of appropriate analogy to drive home the particular idea/ concept. Developing a bank of analogies on different topics in the concerned subject
Module-3 Communicating with great Impact	Emphasis on the change of voice, modulation, facial expressions and gestures matching contents, pace and delivery	Are facial expressions, gestures and modulation appropriate and congruent Has the rapport with audience been established
Module-4 Responding to difficult class situations	Importance of active listening Expressing disagreement in a non-emotional manner, maintaining composure and confidence	Ability to maintain composure in difficult situations Is confidence level sufficient
Module-5 Inspiring peers and students to embrace change	How to speak in a motivating and logical manner with inspiring tone and voice modulation convincing audience to see change	Is the argument logical and methodical Is the appeal emotional enough to convince the audience, in addition being logical and methodical

### 6.0 Conclusion:

More than 250 faculty members have been benefitted through this training concept developed, implemented and reported here. The discussions with the engineering faculty, students, their feedback and also their end-semester course evaluations give a clear indication that the acceptance of these training methodologies is generally high.

For the present day engineering teachers soft skills were rarely taught in their college studies. Many faculty members appreciated the training concept, and the methodology adopted and recognized the holistic approach adopted in the training of faculty. They value the contribution of this concept as an important component in engineering education and in the training of engineering faculty and engineering educators. The faculty members also reported that they found these soft skills extremely useful in their personal and social life as well. Unlike hard skills soft skills are readily transferrable from one context to another.

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**Appendix 1**

**High Impact Teaching Skills Evaluation Proforma**

Name of the Faculty Trainee \_\_\_\_\_

Designation \_\_\_\_\_ School \_\_\_\_\_

S. No		Average	Above Average	Good	Very Good	Excellent
<b>Module</b>	<b>Creating Positive First Impression</b>					
<b>1</b>	Is the faculty member establishing eye-contact with the audience	.	.	.	.	.
<b>2</b>	Is there excitement in the way of communication?	.	.	.	.	.
<b>3</b>	Is the energy level sufficient? (Audibility)	.	.	.	.	.
<b>4</b>	Is he/she exhibiting confidence?	.	.	.	.	.
<b>5</b>	Is the message being presented in an organized manner with proper opening and closing?	.	.	.	.	.
<b>Module-</b>	<b>Simplifying Complex Information</b>					
<b>6</b>	Are different thoughts well connected through maintaining a flow?	.	.	.	.	.
<b>7</b>	“Connecting the known to unknown” has this been brought out well?	.	.	.	.	.
<b>8</b>	Is the analogy effective and self interpretable to the learner?	.	.	.	.	.
<b>9</b>	Is the presentation methodical and followed a logic sequence?	.	.	.	.	.
<b>10</b>	Is he/she open to new ideas and flexible in thought?	.	.	.	.	.
<b>Module-</b>	<b>Communicating with greater impact?</b>					
<b>11</b>	Are the gestures matching with the message?	.	.	.	.	.
<b>12</b>	Are the postures appropriate?	.	.	.	.	.
<b>13</b>	Are the facial expressions appropriate?	.	.	.	.	.
<b>14</b>	Is the voice modulation effective?	.	.	.	.	.

15	Is the language smooth and fluent?	.	.	.	.	.
<b>Module-</b>	<b>Responding to difficult classroom situations?</b>					
16	Is the faculty member responding or reacting?	.	.	.	.	.
17	Is the facial expression pleasant while at stress?	.	.	.	.	.
18	Is the way of communication encouraging interaction?	.	.	.	.	.
19	Are there sympathy, empathy and concern for others in the approach?	.	.	.	.	.
20	Has the difficult situation in the classroom explained properly?	.	.	.	.	.
<b>Module-</b>	<b>Inspiring Peers and Students to Embrace Change</b>					
21	Is the faculty member clearly explaining the situation which calls for a change?	.	.	.	.	.
22	Is the faculty member a good listener?	.	.	.	.	.
23	How is the confidence level exhibited while seeking support for a change?	.	.	.	.	.
24	Is the faculty member likely to win the trust and argument convincingly?	.	.	.	.	.
25	Is the appeal for change logical and emotional?	.	.	.	.	.

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