GC 2012-5623: MISSION10X TRANSFORMING TEACHERS FOR ENHANCING EMPLOYABILITY SKILLS OF ENGINEERING GRADUATES

Mr. Nagarjuna Sadineni, Mission10X Wipro Technologies

Nagarjuna holds an MBA in Technology Management from Latrobe University, Melbourne in addition to Technical Qualification from GIOE, Hyderabad, India.

Nagarjuna, is a Wipro (NYSE Listed as WIT) veteran and has adorned various functional roles and championed pioneering initiatives during his 20+ years of ongoing stint at Wipro and its affiliates.

He started his career with the manufacturing operations team at Wipro Peripherals factory, Mysore and subsequently moved into the marketing team at Bangalore, his contributions in both the roles were significant. His next role was on the "Quality" front. A first generation Black Belt to be certified by Motorola University, US, in Six Sigma methodology, he gave a good momentum to the Quality movement across Wipro Corporation.

For a short period, he was assigned the responsibility of business development & M&A and he identified many acquisition opportunities and made one of the first acquisitions in Wipro Group. Took over this acquisition and turned around the business into high performance team and Profits in short span of time. Later part Nagarjuna headed Operations and Exports Sales responsible for WeP products IBU with a turnover of 240 Crores (>USD40Mn). During this stint, he expanded IT Peripheral Product operations and sales to Europe and Asian markets including China and Japan.

He was an active member of various Industry bodies like MAIT, CII, NASSCOM and has participated and significantly contributed in various forums at Bangalore, Hyderabad & Mysore, was the Vice President of the Mysore IT Forum. With his in depth knowledge of corporate culture, good networking with various IT industries and academia, an adept at applying structured approach to processes/projects and vast experience in handling complex projects - Nagarjuna was selected to lead Quantum Innovation initiative in Engineering Education in year 2007.

Mission10X not for profit trust was established in Sep 2007 to enhance the employability skills of engineering graduates. Under Nagarjuna 's leadership, Mission10X has so far reached out to over 19,000 faculty members in innovative methodologies from 1000+ engineering schools spread across India and has recently launched its second phase targeted by 2013 to reach out to 25,000 more faculty members, develop 250 academic leaders and deploy 2500 unified learning kits to bridge technology gap between industry and academia. Under Nagarjuna's leadership Mission10X established many partnerships Most technical Universities in India have affiliated to Mission10X, International partners like Dale Carnegie, University of Cambridge, Harvard Business Publishing, Development Dimensions International. Nagarjuna holds board member position in the Indo American Chamber of Commerce (IACC) Education Council and part of the strategic planning committee of International Federation of Engineering Education Societies (IFEES).

Dr. Rajendra Kumar Joshi, WIPRO Technologies

Dr. Rajendra Joshi is the Head of Research Center, Mission10X. Dr Joshi completed his PhD from Indian Institute of Technology Bombay, after his post graduation in Philosophy from Bangalore University. Joshi taught for 17 years as lecturer, Reader in philosophy and Vice-principal of Chowgule College-Goa. Later he worked as Dean Education at International Academy for Creative Teaching, Bangalore and as founder Director of Indus Training and Research Institute, a training institute for teachers of international schools.

He comes with 23 yrs of experience in teaching, training and educational management. He has also been member of committee to assess and accredit colleges by National Assessment and Accreditation Council (NAAC) and was closely involved with Mission10X all through, contributed both in designing and delivery of the Mission10X workshops.

His research interest includes philosophy, religion, culture and education. Last year he led a research project on "Grassroots leadership in public schooling in Karnataka" which was awarded research grant by Emerald-All India Management Association for the year 2009.

Mission10X Transforming Teachers
For Enhancing Employability skills of engineering Graduates

Nagarjuna Sadineni, Head, Mission10x Wipro Technologies Bangalore
Dr. Rajendra Joshi, Head, Mission10X Research center, Wipro Technologies, Bangalore

Context: Talent challenges:
Talent is the currency of the knowledge economy and very critical for leveraging the demographic dividend India enjoys. It is imperative that we prepare Indian engineering graduates to make use of the global opportunities. IT/ITES sector alone will need 10 million people and if add requirements from other sectors the opportunity is huge. By tapping into the country's large pool of educated, English-speaking talent, the IT industry has grown from its infancy in the mid-1980s into a US$ 76 billion powerhouse that comprises 6.4% of India's GDP. The IT and BPO industry is growth is largely driven by the supply of the talented manpower However the opportunities available and the success of the Indian IT industry is also posing talent challenges that the industry is finding difficult to manage. The search for talent is pushing employers to look beyond India's so-called Tier 1 cities and colleges – and is revealing critical skills gaps in that talent. According to NASSCOM (The National Association of Software and Service Companies (NASSCOM) is the premier trade association for the IT-BPO industry in India, which represents more than 1,200 Indian and multinational companies) only 10-25% of the 550,000 engineering graduates from 3000+ engineering campuses across India are readily employable. While India boasts of the being one of the world's largest and most qualified pools of professionals, employers are forced to hire people who have their engineering degree, but *lack fundamental technical and behavioral skills*. On an average, Indian IT services companies spend about 2% of its revenue for induction training every year to ensure that its recruits are adequately skilled to execute customer projects.

It is in this context that qualified people represent a strategic resource. Recognizing the widening gap of employability & skills, Wipro in 2007 initiated a *'Quantum Innovation'* project called **'Mission10X'** to address this challenge. *Mission10X sought to create an improvement in the situation by bringing about systemic change in the existing teaching-learning paradigms in engineering education. Mission10X was launched with a vision* ***to enhance the employability skills of graduate engineers ten-fold.***

Mission10X is a not for profit trust created by Wipro to enhance the employability skills of engineering graduates in India. Mission10X was formally *launched on 5th September 2007* – celebrated as "Teachers day" in India.

This is unique project as it extends learning and development beyond the organization to build synergy between those who nurture talent-academia and those who leverage on talent-industry. Wipro as an organization is very focused on training and

development of its people. Mission10X is an initiative to extend this ongoing engagement with learning to academia.

In the year 2006, Wipro conducted detailed research and surveys involving over 300 Placement Officers who are the bridge between academia and industry and 50 heads of institutions, to identify the key factors that could improve the employability of engineering graduates. The survey revealed that there is significant gap in the employability skills of the engineering graduates and the current teaching methodologies used in the engineering institutes and the capabilities of the faculty members are the important areas that needed focus.

To address the challenges in employability, Mission10X identified two possible solutions:

- To **train the students after graduation or before completion of their course to embed employability skills**
- To **integrate the employability skills in the teaching – learning processes** itself during their course of study and create sustainable change in the institution.

Mission10X identified embedding the employability skills in the teaching – learning process as a **long term viable and sustainable approach** by **empowering faculty members in the engineering institutions.**

The thought was that as educators; **teachers are a crucial change agent in this *teaching – learning process*** to build talent for the society and *focusing on this group will have far reaching and sustainable benefits.*

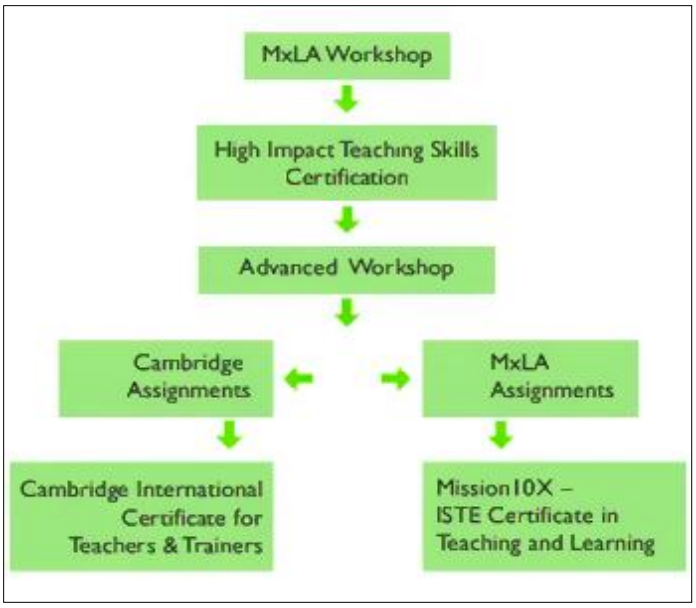
In order to meet these challenges and create a sustainable change in the engineering institutions, Mission10X chose to empower teachers in its innovative Mission10X Learning Approach (MxLA) to engender innovation in learning cultures in engineering education.

Through MxLA, Mission10X provides engineering teachers with the necessary pedagogical skills based on a culture of student-centered learning and a focus on learning outcomes.

Mission10X Learning Approach

Mission10X is sensitive to the contemporary intellectual developments in the human and social sciences and derives its essence from multiple disciplines, methods and approaches. Benjamin. Bloom's Taxonomy and Howard Gardener's Multiple Intelligence Theory form the foundation of Mission10X Learning Approach (MxLA).

After intervention and learning from the Mission10X workshop, faculty members implement these innovative teaching practices in their classrooms and participate in the advanced level of workshop which is the second intervention in the series and is intended to take the participants few steps further in the transformation process.



Next step in this intervention is *"Learners Forum"* that is conducted 4-6 months after faculty complete the 5 day workshop. This half day session, is exclusively devoted to *"sharing of best practice*s"*.* Each faculty would share what innovations were brought into the classrooms; they would also share certain behavioral changes that would have happened in themselves after completing 2 levels of training apart from the classroom related challenges. The objective of the third connect is to infuse higher confidence among the faculty and enable peer learning to make the initiative sustainable

This helps the faculty members to become more effective in their classroom teaching process and embed employability skills both technical and behavioral amongst the students.

Mission10X Workshops

Mission10X conducts layered set of workshops for the benefit of faculty. This model itself is unique as we go back to the faculty who were trained and handhold them while they implement the learning's. This aspect is nonexistent in traditional training modules.

The involvement with the faculty members begins with a 5 day workshop. The components of the workshop are:

1. **High Impact Teaching Skills** - To help faculty create impact on students by synchronizing their verbal, vocal and visual presentation skills- Facilitated by Dale Carnegie University.
2. **Innovative Teaching Techniques** - Facilitating active learning and developing reflective practitioners.
3. **Methods to implement innovation in engineering classrooms** - Eclectic pedagogical framework through Mission10X Learning Approach (MxLA)

Components of the Mission10X workshop

Mission10X offers unique opportunity to the faculty members of engineering colleges to go beyond their conventional teaching practices and experiment with innovative learning techniques and styles which help them broaden the framework of teaching and enrich their learning.

The workshops also provide an opportunity for the faculty members to enable engineering college faculty with new and alternate training methodologies that provides input to a faculty to become a mentor, guide and a facilitator in the class and thus prepare their students to become more employable. These programs help the faculty to imbibe new skills and be part of the transformation of Teaching Learning paradigm

Mission10X is backed by a team of multi-faceted individuals who are passionate and committed. Core team includes professionals from Engineering, Cognitive sciences, Humanities and Human Resource Development with wide ranging academic and industry experience.
Mission10X Advisory Board consisting of senior academicians who have a collective experience of over 150 years in the field of engineering education provide the critical inputs for the programme and review the programme.
One of the highpoints of Mission10x journey is the collaborations and partnerships that have been built to empower the engineering faculty. Mission10X has partnered with International Federation of Engineering Education Societies, Cambridge International Education of Cambridge University Indian,, Development Dimensions International, Harvard Business Publications , Institute of Technology Bombay and Chennai. and many technological universities across India.

Building a virtual professional learning community:
To give further academic impetus and practice innovative methods, Mission10X encourages participating faculty members to create innovative teaching resources in their areas of expertise and share it among the community of faculty. As a result of this intervention the repository of innovative community assets crossed 8,500 mark, across

19 engineering disciplines, making it one of the largest community assets creation in engineering space. All these assets are hosted
in Mission10X portal which a unique community faculty portal is providing a forum for information sharing and learning within the Indian faculty engineering community. Mission10X portal (www.mission10x.com) is created as back bone of Mission10X to support and connecting the participants spread across different geographical locations. Mission10X in its true **spirit is creating professional learning community.** Facilitating regular activities like online registration of participants, broadcasting of messages/events and serving as an online repository for the engineering assets, it also many certain innovative features like Community assets, e-learning courses, Blogs, Discussion Forums, Mentoring.

Challenges faced in developing, implementing and sustaining the practice & solutions adopted:
Mission10X, being Wipro's first large intervention in higher education, has provided a great learning experience all throughout. The first hurdle or challenge was in **getting the academia to believe that change was necessary and we have the capability to trigger it**. It involved carefully unlearning the traditional methods and learning innovative methods.

The second challenge was to **scale up the idea and build the necessary team and structure to handle it**. Reaching out across the length and breadth of India in a structured process had a great amount of learning and was possible because of the passionate team which relentlessly inspired the academia and built systematic processes to scale up.

The initial goal of Mission10X was to empower 10,000 faculty members. This goal was achieved ahead of its target in September 2010. In Phase 2, Mission10X now intends to empower 25,000. More than 70% of 20,000+ empowered faculty members are from the rural engineering colleges in India.

Since the program is focused on the pedagogy of engineering institutes, the benefits are 3 fold.

1. **Engineering graduates** – Mission10X facilitates enhancement of student's employable skills through empowered faculty to address this challenge.
2. **Faculty & institutions** – Focus on building long term capability and learning culture
3. **Industry** – To get workforce with enhanced skills

Mission10X Phase 1
Mission10X started with a noble thought and an ambitious target. The thought was that as educators; **teachers are a crucial change agent in this teaching – learning process to build talent for the society** and **focusing on this group will have far reaching and sustainable benefits**.

The initial goal of Mission10X was to train 10,000 faculty members. This goal was achieved well within September 2010.

The journey of phase 1 had important milestones and the program took shape as walked on the path. Mission10X started the modernization of engineering education through workshops. Thereafter, partnered with Cambridge University and we started the Mission10X certificate programs offering a unique opportunity to faculty members of engineering colleges to go beyond their conventional teaching practices and experiment with innovative learning techniques that focus on helping the students to:

- Absorb higher levels of understanding of various engineering subjects
- Effectively apply the concepts learned to varying practical situations
- Develop key behavioural skills required for employment

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Over this long journey we have collaborated with many international and national educational and industry bodies, such as the University of Cambridge, Dale Carnegie Training, International Federation of Engineering Education Societies, and NASSCOM (an Indian IT Industry Association).

Mission10X has harnessed the support and encouragement of universities across India. Teachers have a strong incentive to participate in the training, not only to enhance student learning, but also as an opportunity to network with and advance their own careers. Mission10X has created a powerful professional

Mission10X Phase II – Plan

Mission10X now intends to train more than 25,000 teachers. Mission 10X Phase II plan was launched on Sep 6th 2010 after having completed the Phase 1.

As part of this plan Mission10X envisages:

- to develop **250 academic leaders** to build institutions of excellence
- to deploy **2500 unified learning kits** to bridge the technology and learning gap between industry and academia
- to empower **25,000 more faculty members** in Mission10X Learning Approach

a) Mission10X Unified Technology Learning Platforms (UTLP)

Technology gap that exists between University laboratory infrastructure and the industry practices is adding to the challenge of employability. Mission10X in collaboration with academic and industry partners has develop Unified Technology Learning Platforms to bridge this gap. UTLP addresses the needs of the circuit Branches which include Electrical & Electronics, Electronics & Communications, Computer Science, Telecommunications, Instrumentation and Information Technology.

(b) Academic Leadership Programs

Institutional climate and culture is another critical factor which impacts student learning and employability. In order to address this issue, Mission10X initiated leadership development programme for the Principals of engineering colleges in institutional building. This programme is designed as a multi level Academic Leadership Program (ALP) involving international partners like Harvard Business School Publishing and Development Dimensions International (DDI).

Although the program in itself has been very well received and has done tremendously well over the last 5 years, the need for it is to be sustainable over a period of time.

Team Mission 10X has been able to do so by:

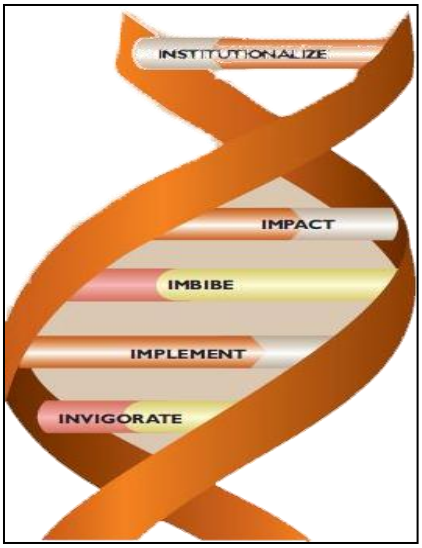
1. Continuous Research through the **Mission10X Research Centre**
2. Creating **Champions of Change**

Continuous Research through Mission10X Research Centre

To be viable over a long period of time it is important for the program to upgrade and constantly improve its quality. Mission10X research center provides the research backup for upgrading the Mission10X workshop contents and builds a body of knowledge in the emerging area of engineering education. Members of the research center participate in national and international conferences and other forums of engineering education to share Mission10X experience and collaborate in engineering education. The center has been collaborating with reputed engineering institutions and professional bodies in designing training programs and research. Mission10X research center focuses on innovations in engineering pedagogy, technology in education, employability and facilitating research culture in engineering colleges.

Creating Champions of Change

While Mission10X provides the ecosystem for change in the form of Workshops, the Mission10X Portal, facilitating development of Assets etc., the most fundamental motivator for change is the drive within each Champion to make an impact. The external change would not be possible without a change within. Champions drive change because it is in their DNA. The Mission10X process takes faculty through a 5-step transformation that helps make them Champions of Change and hence makes the program sustainable.



1. INVIGORATE: Mission10X faculty begins the change process by attending Mission10X workshops.

2. IMPLEMENT: Based on the learning during the Mission10X workshop, faculty members practice Implementation of the new teaching methodologies by developing teaching learning material and conduct classes as per session plans.

3. IMBIBE: Faculty participates in closed study groups, which helps them Imbibe the essence of the Mission10X Learning Approach.

4. IMPACT: By Invigorating, Implementing and Imbibing Mission10X Learning approach, faculties are able to make a positive impact on the teaching learning process.

5. INSTITUTIONALIZE: Committed faculty propagates their innovative thoughts on teaching-learning across the community via different channels with the objective of building employability skills in students. They institutionalize the changes within their colleges by motivating other faculty members to adopt Mission10X methodologies.

Impact of Mission10X

Having worked with over 20,000 teachers spanning across 25 states in India, Mission10X research center undertook a research study to explore the impact of Mission10X intervention on the teaching styles of the engineering faculty. The study (www.mission10x.com) focused on two groups of teachers- experimental group and control group and was conducted in for phases- base line teaching assessment, post-intervention assessment and reflective assessment. The study, indicates a significant shift in teachers' attitudes and teaching styles

- Mission10x trained faculty have shifted their opinions more towards the learning paradigm. The study observed a 16% enhancement in the response to the statement: "Teachers can teach students to be creative thinkers" and an '8% dip in

the response to the statement – “To teach effectively, teachers need to control students”

- There has been an enormous increase of participants who strongly accept the need to be innovative (from 22% to 86 %.) Faculty have reported using innovative teaching methods like - Classroom Discussions, Video Lectures, Education Trips, Building relevant models, Open book tests, Classroom presentation by students, Journal reading, Seminars, Projects on selected topics and Oral and written quizzes to name a few.
- There has been a significant shift (from 15 % to 33 %) in faculty owning responsibility using innovations in the classroom.

Having been empowered with the new ways and methods, faculty has demonstrated conviction that innovations can be brought into engineering classrooms in a sustainable manner. This research study establishes that as a result of Misssion10X intervention faculty are willing to use innovative teaching-learning practices to embed employability skills in the teaching of engineering.

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