Our Transformational Journey…

2007 - 2017
A Tier-II institution. Low visibility to students and Industry

(Economically backward region without Industrial ecosystem)

Affiliated college; exam oriented; rigid academic structure

Poor research base, networking with industry / stakeholders

No differentiator for brand positioning; Poor campus hiring

Just another Engineering College; unable to attract high quality students.

Absence of stretching goals; Complacency setting in

We thought, we were doing our best under given constraints and circumstances!
A number of institutions were also repeatedly discussed by interviewees as ‘places to watch for the future’, but were seen to be at too early a stage of development to yet identify as ‘emerging leaders’. Samples are given in the box below.

**Places to watch**

- NMiTE, UK, a teaching-only engineering and technology institution currently under development, with a focus on creativity, innovation and experiential learning and aiming to admit its first cohort of students in 2019;
- the Lassonde School of Engineering at York University (Canada), a new engineering school that aims to educate ‘renaissance engineers’ and admitted its first undergraduates to its programmes in 2013;
- **BVB College** (India) which transformed its undergraduate curriculum to focus on social and technological innovation in a multi-disciplinary learning environment;
- the new engineering school at Insper in Brazil which has developed a new hands-on, student centred curriculum.
Setting Aspirations..

Indian Engineering Education Scenario

- Number of Engineering Colleges 3289
- Total Enrollment capacity : 1.5 million

Be aware and use the space available

- Affiliated Colleges
- Autonomous Colleges
- INIs Universities (non-affiliating)
- Our Aspirational Journey

Level of Autonomy

Space for Innovation

Branding Potential

> 95 %

< 5 %
Our Transformational Journey...

1947

BVB Affiliated College

2007

BVB Autonomous College
Our Transformational Journey...

1947

1947

2007

2015

BVB Affiliated College

BVB Autonomous College

Technological University

KLE Tech.
Our Transformational Journey...

Three Pillars

1. Building distinctive educational experience
2. Leading through Transformative Leadership and Governance
3. Playing Generative Role in the regional Development
Our Transformational Journey…

Three Pillars…

1. Building distinctive educational experience
1. Building distinctive educational experience

2007-08 - Autonomy Granted

• First year it was more about adopting the existing University Curriculum in credit form.

• Changes in contents of few courses in a selective manner based on our experience / perception.

• Lack of awareness about a holistic approach for Curriculum reforms.
1. Building distinctive educational experience

The Game-Changer

Indo US Collaboration for Engineering Education (IUCEE),
Faculty Leadership Institute FLI 2008 –Workshops at Infosys, Mysore

- ‘Curriculum Innovation’ by Lueny Morrel.
- ‘Effective Teaching’ by Prof. Richard Felder & Dr. Rebeca Brent
- ‘Service Learning’ by Dr. Bill Oaks.

Deliberations at the College level

Clarity of path to be followed

Curriculum Framework
Design of new courses
Pedagogical Innovations
1. Building distinctive educational experience

- Adapting Outcome Based Educational framework
- Introduction of new courses; with proper research and collaborations; examples
  - Social Innovation
  - Engineering exploration
  - Engineering design
  - Product design and realization....
  - Research Experience for Undergraduates
  - Global immersion in Innovation & Entrepreneurship
  - .........
- Moving towards Practice Based Curriculum
- Creating appropriate learning environments
i. Adapting Outcome Based Educational framework

- **Clarity of Focus**
  - Student Capability at the end of graduation
  - Program Outcomes
  - Graduate attributes (ABET / NBA)

Collectively Achieve

- **Course Outcomes**
  - Course-1
  - Course-2
  - Course-3
  - Course-n

Program Design

- Content, Pedagogy and Assessment

2008 - 2013
i. Adapting Outcome Based Educational framework

Establishing strong Connect between Assessment & Outcomes

- Courses Assessment (Exams)
- Laboratory Assessment Rubrics
- Project Assessment Rubrics
- Student Works

- Course Outcomes
- Blooms Taxonomy levels

• We are one of the earliest adapter of OBE framework in India (2008)
• Based on our experience, have trained over 1500 faculty across India in OBE Framework
1. Building distinctive educational experience

ii. Introduction of new Courses

iii. Adaptation of Innovative Pedagogical Practices

To Fulfil

• Outcome attainment gaps
• Industry/ Technology trends

To build

• Experiential,
• Contextual and
• Situated

Learning environments

These efforts need have
a clear, shared sense of purpose across the organization.
1. Building distinctive educational experience

- Higher level Problem solving skills
- Skills in need identification, ideation, synthesis, and developing innovative solutions
- Applying analysis and design principals to solve real life problems
- Communication and teamwork skills
- Understanding multidisciplinary approach in Engineering

**Example:**

**Observed outcome attainment gaps:**

- Introduction of new Courses
- Adaptation of Innovative Pedagogical Practices

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1. Building distinctive educational experience

Introduction of New Courses

Social Innovation
Course at First year

- To build students' capacity to use problem solving skills to address social issues through innovative solutions.
- To develop skills in need identification, ideation, synthesis, and creativity.
- To transform student mindset to reframe Problems as Opportunities.

Student Learning Happens through on-field Projects

Every year Over 250 projects are done by First year students in Social Space.

Drawing tools for blind

Back to school

Cart for Roadside Vendor
Introduction of New Courses

**Engineering Exploration**

**Course at First year**

- Highly experiential; learning through *design activities*
- Applying *analysis* and *design* principals to *solve real life problems*
- Connecting *needs* and *Technologies*
- Understanding *multidisciplinary approach* in Engineering

*Designed in collaboration with Virginia Tech, USA*
1. Building distinctive educational experience

Engineering Exploration
Course at First year

Course projects at First year
1. Building distinctive educational experience

Introduction of New Courses

**Engineering Design**

Course at III Semester

- Practicing concept of product design as a creative process
- Learning design tools in context
- Highly experiential learning through course project

Sharing model of integrated lunch box and water bottle with school children
1. Building distinctive educational experience

Introduction of New Courses

**Product Design & Realization**

Course at V Semester

Interdisciplinary (Product Design) Experience

• Today, A product is a result of multidisciplinary efforts

• Important to Learn to fight, to Collaborate and Co-Create
ii. Building distinctive educational experience

Innovation efforts need have a clear, shared sense of purpose across the organization.

Strong Curriculum Spirals

Understanding scope of Engineering
Freshman (1st Year)

Understanding societal needs

Social Innovation

Designing Solutions

Engineering Design

Product Realization

Sophomore (2nd Year)

Junior & Senior Projects (3rd and 4th Year)

Projects
1. Building distinctive educational experience

Introduction of New Courses  Collaborating with Industry

Component Level to System Level Design

• Most of the Courses and design experiences in engineering end up at component level
• Student lack exposure to design of complete systems
• Inability to produce appropriate industry standard drawings for manufacturing

Introduction of New Course

**Machine Tool Design**

Course at VI Semester

with **Aequus – India, Belgaum**
1. Building distinctive educational experience

Introduction of New Courses  Collaborating with Industry

Our Experience in Automotive Electronics…

- Building a strong Vertical in Automotive Electronics Opportunity
- Industry Collaborators: Bosch, KPIT
- Dedicated Faculty team

Year 1
- Elective Course
- Laboratory

Year 2
- Core Course
- Laboratory (open ended)

Year 3
- Mini Project

Present Year, 165 students placed in Automotive electronics related Companies
1. Building distinctive educational experience

Introduction of New Courses

‘Research Experience for Undergraduates (REU)’

objectives:

- To provide real-world, hands-on research experience for undergraduate students
- To provide an opportunity to work directly with a faculty member on a bonafide research project.
- To motivate students for higher education

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of REU students</th>
<th>Number of Guide</th>
<th>Number of Publication</th>
<th>Number PGs REU student</th>
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<tr>
<td>2011-12</td>
<td>18</td>
<td>22</td>
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<td>2012-13</td>
<td>31</td>
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<td>8</td>
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<tr>
<td>2013-14</td>
<td>30</td>
<td>44</td>
<td>23</td>
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</tr>
<tr>
<td>2014-15</td>
<td>46</td>
<td>48</td>
<td>26</td>
<td>4</td>
</tr>
<tr>
<td>2015-16</td>
<td>67</td>
<td>54</td>
<td>55</td>
<td>8</td>
</tr>
<tr>
<td>2016-17</td>
<td>68</td>
<td>60</td>
<td>30 (ongoing)</td>
<td>2</td>
</tr>
<tr>
<td>2017-18</td>
<td>89</td>
<td>81</td>
<td>--</td>
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</tr>
</tbody>
</table>
Pedagogy follows Rule of Four:

*Every topic should be presented*

- Symbolically
- Numerically
- Graphically *(Visual)*
- Verbally *(Contextualize)*

Reforms in **Mathematics** Teaching

The Mathematics curriculum for four semesters has been modified in line with the **Calculus Reform Movement** led by Harvard Calculus Consortium.
1. Building distinctive educational experience

‘Center for Engineering Education and Research (CEER)’

Center dedicated to Encourage & Support innovation in curriculum design, teaching – learning and assessment

• Yearly Faculty Conclave:
  To showcase the pedagogical innovations by faculty members

• Training workshops from well-known International researchers in Engineering Education Research
Our Transformational Journey…

Three Pillars…

2. Leading through Transformative Leadership and Governance
2. Leadership and Governance

Our belief about Organizational Growth

New Initiatives, Ideas
New Ways of working

Present

Life-span of a paradigm

Growth

Time

New Initiatives, Ideas
New Ways of working
2. Leadership and Governance

Our enabling Beliefs…

• We are not aided (Govt.) College (Mindset Change)
• Always question Status-quo
• Learn, innovate, adapt (Fast)
• No fear of Failure; It’s OK to fail
• Keep looking for best practices and learn from them
• Today academics is all about the teamwork of faculty
• Highly decentralized management processes
• Strategic thinking & Good Governance practices matter
• First qualification for leadership; belief in what we are doing
2. Leadership and Governance

"Good governance is vital to good governance development - sharing experiences"

The Technical Education Quality Improvement Programme (TEQIP-II) is implementing good governance through the documenting of their institutional governance processes and practices in a Governance Guidelines Document. BVBCET, Hubli, has completed all three stages of the good governance programme. The principal, Dr. Shettar, shares his experience of the process and its relevance in his PPT presentation to institutions in Andhra Pradesh.
2. Leadership and Governance

BVB is One of the two Colleges in India considered by NPIU and World-Bank as Model institute for ‘Good Governance’

(amongst 190 TEQIP Colleges nation-wide)

- Strong Board and AC with independent active members
- Strategic thinking (strong strategic planning process)
- Stretching Goals
- No micromanagement by Board
2. Leadership and Governance

**Few Lessons....**

- Transformation process, Innovation efforts need to have a clear, shared *sense of purpose* across the organization.

- Senior organizational leaders should recognize the importance of a growth mindset, and regularly *take risks* in pursuit of bold outcomes.

- Set sense of urgency; If you are to make tangible progress, you must approach the work with an incredible *sense of urgency*—set aggressive milestones and deadlines.
2. Leadership and Governance

### Few Lessons....

- Without the essential capacity to execute, the impact(s) from innovation will be limited and temporary.

<table>
<thead>
<tr>
<th>Social Innovation</th>
<th>Engineering Exploration</th>
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<tbody>
<tr>
<td>No experience in Social space</td>
<td>Never offered a multidisciplinary course at 1\textsuperscript{st} year</td>
</tr>
<tr>
<td>To be delivered to 1000+ students</td>
<td>To be delivered to 1000+ students</td>
</tr>
<tr>
<td>Need to handle 250 projects in social space</td>
<td>Need to handle 250 multidisciplinary projects</td>
</tr>
<tr>
<td>Need about 12 faculty with social science / engineering background</td>
<td>Need about 12-14 faculty from different departments to work together</td>
</tr>
</tbody>
</table>

Whenever we are trying to do something new
– our first efforts are not always the best
(This often brings in hesitation);
Be prepared to make hard Choices
Organizations need Clear and Consistent processes

These processes must continually reinforce its commitment to Change—even when those efforts do not always lead to clear “wins.”
2. Leadership and Governance

**Few Lessons....**

- Engineering Exploration
- Pedagogical Initiatives
- Social Innovation

Structures & Processes

- Put light-Informal Structures to Drive Initiatives

Informal Structure Emerge → Inform

- Center for Engineering Education & Research (CEER)
- Dept. of Humanities and social science

Modifications to formal organizational structures.
2. Leadership and Governance

Capacity Building

- Individuals and teams need continual training, support and opportunities to practice their pursuit of new approaches.
- **Without the essential capacity to execute, the impact(s) from innovation will be limited and temporary.**
- Encourage Sharing stories of work and speed up the learning curve for your organization.

Trainings from IUCEE, Industry, NGO’s, and continuous Internal workshops
Our Transformational Journey...

Three Pillars...

3. Playing Generative Role in the regional Development
3. Playing Generative Role in the regional Development

Challenges of Tier-II / Tier-III City, Colleges….

- Lack of Industrial Ecosystem
- Lack of Visibility
- Hesitation of Industries to Collaborate (logistic reasons)
3. Playing Generative Role in the regional Development

Industrially backward Tier II / Tier III City

Industrially Backward Tier II, Tier-III City

Lack of Employment Opportunities

Further Loss of Competitiveness

Further Decline in Competitiveness

Migration of Graduates
3. Playing Generative Role in the regional Development

Third role of Universities / HEI’s-

Traditional roles

• **Knowledge transfer** - Human capital development
• **Research and Development** - knowledge generation

Third role

Generative role in driving **Regional Economic and Social Development**

**Triple Helix Model**

| University / Institutions | Industry, foundations | Government |
3. Playing Generative Role in the regional Development

Questions ..... 

• Can BVB directly impact economy of Hubli-Dharwar region, by Creating Entrepreneurial Ecosystem?

• Can this ecosystem be leveraged to enhance ‘Industry Institute Interaction’ and hence student learning experience?

• Can we create a Model (Triple helix) for typical engineering institution in Indian Tier-II / Tier-III City
formation of
Centre for Technology Innovation & Entrepreneurship (CTIE)

With a Vision

*To be a Pioneer*

to Foster, Enable and Grow the Innovation and Entrepreneurial Ecosystem

in Tier-2 Cities
3. Playing Generative Role in the regional Development

Our Model

**KLE-CTiE**

Two Pronged Approach

• Attract
  • Support External Entrepreneurs

• Inspire
  • Educate & Enable Student startups

Help to Build Entrepreneurial Ecosystem
3. Playing Generative Role in the regional Development

Formal and Informal Interventions with the student Community….

KLE Tech START-UPs

- Capstone Track (19 credits, 50-60 students)
- Butterfly (Tech B-plan competition)
- Ideation Camp

PUPA (1250 students/over 400 projects)

Student Community

Experienced Entrepreneurs

Driven by Student leaders MIB

Minor in Entrepreneurship
- New Venture
- Fin & Mktg
- New Prod & Svcs.
- Innovation
- PI&E

First Year to Final Year

3. Playing Generative Role in the regional Development
We have incubated 38 companies in the campus

Enabled adding over 400 new engineering jobs to the region’s economy

Most of these jobs are at the engineering entry level thus providing a strong foothold for arresting the talent migration

More than 600 students work with these companies

Two Companies above 100 Cr valuation
Our Transformational Journey…

300 % Jump in Placements

250 % Jump in Salary offered

400 % Jump in Internship offered

Recognition
- IUCCE
- MIT Report
- DST

Several Colleges across India replicating our model

Overall Impact
Our Transformational Journey…