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A Vision for Sustainable Future in Engineering Studies

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Abstract*—This paper gives a proposition how to develop new type of engineers who can fill the vast void between engineering studies and environmental impact by it. It suggests the pathway to develop syllabus and evaluation for such kind of new breed of engineers.* ***They should become hunter-gatherers of models, processes, and ways of living and production that may already exist in sustainable ways around us.***

Keywords:—*green economy, unconference, melas, consumption, hunter-gatherers, Sustainable future plan, fuzzy logic, carbon footprint, Industrial ecology, Material Flow Analysis, Embodied energy.*

1. INTRODUCTION

This article is directly adopted from **'MAKE SENSE, NOT STUFF'** A three step plan to connect Engineering and Design schools with the green economy by **John Thackara** [1]. In Present Scenario a new product was launched somewhere in the world every three minutes. Most of these products involved the *in*efficient use of energy, water, and natural resources. Each product thereby contributed to the 70 million tonnes of C02 that is emitted into the earth's atmosphere, every 24 hours,

2. LIMITATIONS

Limitation of Present Engineering and designing school

- Designers and Engineers are trained for design\Engineering-for-production cost efficient with no commitment for nature and earth.
- Design for individual expression or Engineers involved in multinational with no voice on their concerns.
- Doing Jobs with no connection with self or society.
- Software based research with very limited experimentation and no sense of its environmental impact.
- The ideas, images, symbols, and forms so created and especially the billions spent on advertising and marketing add to the earth crisis.
- All these practices lead to their outcome of unsustainable consumption and production.

Limitation of Present Engineering school

Engineering schools are still being encouraged to write essays about solar or wind that is all they understand by sustainability, instead of developing a thought-provoking research. Emitting messages, however clever or evocative they may be, is not the same as helping real people, in real places. The

transition to sustainability is no longer about messages, it's about activity.

- What should be new Engineering Education?
- How the Engineering education does become accountable to sustainable future?
- 3 Steps Suggested by John thackara

Step One: Map assets

Trace out the assets or resources already present in the region.

Step Two: Connect locally

Offer your school's Engineering skills and communication in a respectful way to connect locally. Assume that they will be the co-authors of any new solutions that emerge.

Step Three: Use new language

Green Economy, Local Currency, Local Melas , Festivals, Unconference

3. THE NEW ENGINEERS

Most elements of a sustainable world already exist. Some of these elements are technological solutions. Some are to be found in the natural world, majority of solutions are social practices, some of them very old ones that have evolved in other societies and in other times. **From this insight flows the proposition that Engineers should become hunter-gatherers of models, processes, and ways of living and production that may already exist sustainable around us –.** Rather than engineering new products and systems from scratch, we need to ask: who has cracked a similar question in the past? How might we

Table 1: Sustainable future plan for Engineering Studies

S.No	Sector	Sustainable future	Assets in MP	Projects
1	Education	Student empowerment in its learning, with a deep understanding of responsibility towards environment and society	School, Colleges, Universities, Coaching Classes, Libraries, Groups, Internet , Pears, Experts, Festivals, Exposure to different Creative and Musical Events	student parliament, carbon footprint tracing awareness exercise,
2	Transport or Mobility	Sustainable transport will be Maximum use of Public transport example Rickshaw, buss etc Minimum use of private transport as cars, bike etc	rickshaw, cycle metro bus, Shared Autos, electric bikes, cars, trucks, vehicle factory vans etc.	Redesign of Rickshaw, bus time table redesign, Hybrid Vehicle Conversion, Roads redesign, car sharing websites, call centers etc
3	Power	Sustainable power will be in Maximum use for example solar energy wind energy manual power Paddling energy animal power etc	MPEB, Solar panel vendors, Sufficient sun light, Hydral power cycles paddling power manual power,	Set up of power system at rural area of MP

learn from, adapt, and piggyback on their success?

Our region Madhya Pradesh

- Green Organic State… most of the vegetables and food come from neighboring villages
- Sustainable transport cycle rickshaw still popular
- Cement less houses Can be seen around the outskirts of city
- There is community binding people know one another, festivals are celebrated
- Mela's still popular, people do practice alternative healing methods

Constructivist approach

- Learning has to be Situated
- Learner takes the **ownership of learning**
- Better learning happens in group than Individuals

Example syllabus design from projects

- Sector Transportation
- Project name Cycle Rickshaw
- Courses involved related to cycle rickshaw

Theory

Different types of rickshaws in the world why it is sustainable transport Material used in different parts of rickshaw their properties, their manufacturing process, balancing in rickshaw, different types of stress diagrams in different parts, design and understanding of frictional as well non frictional parts, etc

Practical

Applying reverse engineering to gather the data and understanding the operations

Evaluation of these projects

Emotional

Either by fuzzy logic or kensie mathematics or else any psychological test developed with set questionnaire asked from the real people directly benefiting or involved

Environmental… tracing carbon emission and foot print on environment three new tools have increased transparency:

- A framework called industrial *ecology;*
- A measurement system called *Materials Flow* Analysis *[*MFA*) or Life Cycle Analysis;* and a concept called
- embodied energy.
- Economical

REFERRENCES:

[1] John Thackara Make Sense Not Stuff version 31 March 2009 Cumulus Conference London, 2009 (27_30 May 2009)

[2] http://comuluslondon2009.com