



About USQ & our Faculty:

- Approx 23,000 Students
- A leader in Distance & Online Learning
- 3 Campuses; Toowoomba, Springfield (Brisbane), Frazer Coast (Hervey Bay)
- Flexibly structured accredited courses
- A member of the “OpenCourseWare” Initiative
- A full suite of Engineering & Spatial Science UG & PG courses, including short term in-house workshops
- Industry Partnerships
 - Industry focused courses
 - Focused applied research teams
 - Outcome orientation





Sustainable Engineering Management Interest Group

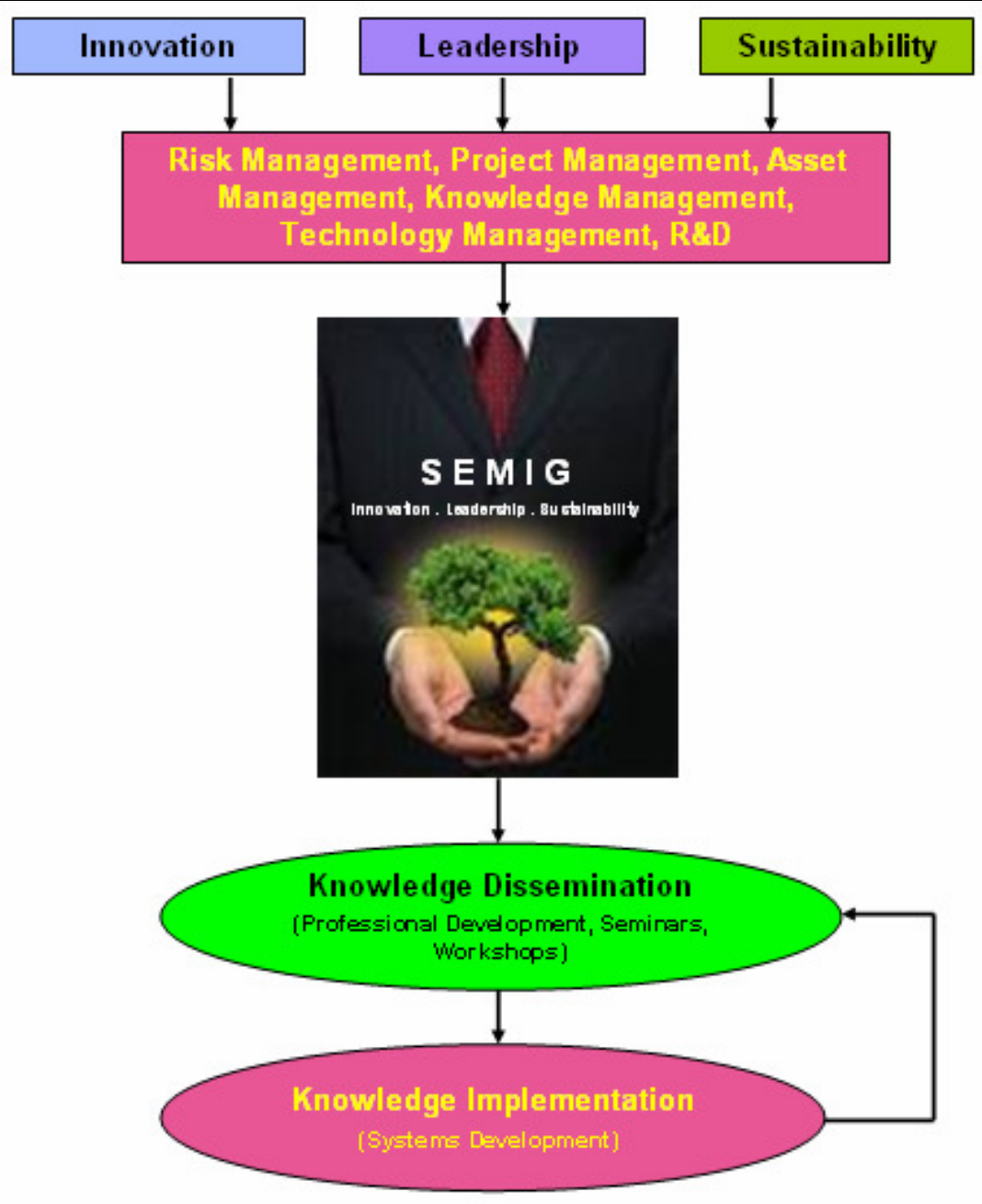
Innovation . Leadership . Sustainability

Mr Steven Goh - Toowoomba Coordinator
Dr David Thorpe – Springfield Coordinator

Mission Statement

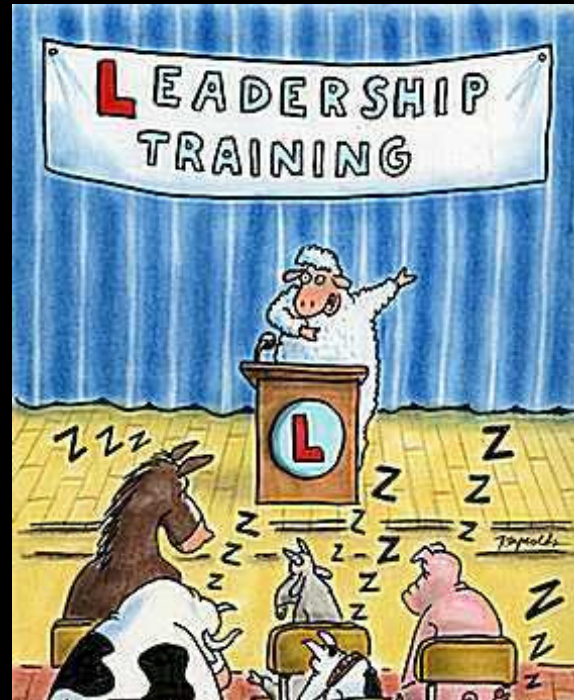
To be at the forefront of Engineering Management research in the area of Innovation, Leadership and Sustainability, hinged on collaborative projects with industry and be an avenue for knowledge dissemination and implementation.





The Engineering Manager of the 21st Century: Implications for Education and Professional Development

The Redundancy of the MBA?



Steven Goh
Lecturer in Manufacturing & Materials
and Engineering Leadership



Background

- “2020 Vision Report: The Manager of the 21st Century” in 2006; Hinged on the “Karpin Report” released in 1995
- Innovation & Business Skills Australia (IBSA) compiled by Boston Consulting Group
- The report identify the attributes and skills needed for future managers to be properly equipped to manage effectively in 2020
- A review of current development in managerial training and the change in trends of workplace’s demographics
- Investigate the implications on engineering management education at postgraduate levels
- Supported by case studies and anecdotal evidences
- An initial investigation requiring further quantitative work

The Year 2020

12 years from today but a very different place:

- A period of Strong Global Growth
- China & India Biggest Economies
- Russia & US
- \$US & \$Euro
- \$1.50 AUD to \$US
- Oil Prices about the same as today indexed
- Australian Population 35-40Million People
- A period where X, Y, and Z generations in the workplace
- Technology driven society but conflicting
- Housing Affordability Problem
- Recessional Pressure in Australia

Summary of Findings

Changes in the operating environment and workplace will see the Engineering Manager of the 21st Century to be:

- Global & Mobile
- Culturally Aware
- Strong Technical Acumen
- Strong interpersonal skills & High EQ
- A Leader of teams
- Encountering complex issues
- Increased number of diverse stakeholders
- Hard to find Work/Life balance
- Life-long learning habits

2020 Vision - Findings

Changes in the workplace are likely to have major impact on the manager's skills will require:

- Managers will need to rethink their role in the years to 2020
- Specific "know their stuff" managers will be favoured over the generalist managers
- Managers will need to become more team focussed
- Personal challenges for the 2020 Manager

Case Studies

- Innovation & Business Skills Australia
- Murdoch Business School
- Faculty of Engineering & Surveying, USQ
- Toyota
- Fletcher Building Products
- IBM
- Coffey International
- Bendigo Bank and Swinburne Industry Solutions
- New Dimension in Management Education at Universities
- The Corporate Universities
 - ANZ, GHD, SKM, Engineers Australia

Conclusions

- Vision 2020 has provided an insight into the required attributes and skills needed for managers to work effectively in the future.
- The changing dynamics of management education is impacting on universities, however, it is still very fragmented. OPPORTUNITY!!!
- Impact on the creation, structure and delivery of management related courses.
- Emphasis is placed on customisation of program, tailored to specific organisation and industry
- Strong demand for courses to leverage experience with knowledge that can be apply in the workplace immediately
- Partnership between universities and industry has grown dramatically in the last few years.
- Industry is the current driver of change in course content and delivery methodology
- Operate via collaborative links with teaching institutions that are leaders in flexibility and customisation

- Increase demand for Technical “up-skilling”, leadership development programs, and short-term workshops
- Professional development are used as part of a recruitment and retention strategy by industry
- Decreasing demand and less emphasis on traditional or generalist management education such as the MBA
- Managers of the future may have the following attributes and skills:
 - Manage a global workforce and diversity in the workplace, and high adaptation to various cultures
 - Possess intellectual grunt, highly analytical and decision making skills, and a deep knowledge of the industry or enterprise
 - Possess high emotional intelligence and strong inter-personal and leadership skills, and most importantly, team related skills
 - Possess a life-long learning and explorative attributes
 - The ability to balance work/life demand requiring high energy levels and resilience

Implications for Educators

- Opportunity

- Innovation in engineering management courses in partnership / collaboration with industry and professional association
- Under-exploited by engineering faculties in most Australian universities, with the exception of Swinburne and Deakin
- Course content may have to be highly innovative, and customised to specific industry with flexible delivery
- Involve technical “up-skilling”, leadership development, and strands of management and business skills

- Threat

- Indications are that corporate universities are entering the engineering management sector, and traditional educators such as universities will be sidelined
- This scenario is evidenced in the US/Europe with the proliferation of corporate university
- The change has already impacted on business schools; “Corporate Australia” are using in-house leadership development (not universities), particularly in the financial sector

Recommendations

- Proactive approach in liaison with industry and professional associations, to actively innovate in the delivery of professional development of engineers
- Flexibility in delivery is crucial in maintaining the viability of PD providers to exist and be relevant to needs of industry and the individuals
- High degree of customisation in course content and delivery designed around a particular organisation, industry or professional association
- It may be advantageous to universities/Private PD Providers to combine expertise and resources
- Increase short-term courses and workshops in both technical and management topics, and consolidate courses which can be articulated into formal qualifications
- Restructure courses to include an informal learning process and freely available online resource into traditional course assessment
- Engineering education to incorporate leadership modules within their courses, and should be flexibly structured to cater for a mixture of:
 - Technical “up-skilling”
 - Leadership development
 - Management studies
 - Business studies

Expression of Interest

Invitation for Industry Participation

Management Education for Engineers in the 21st Century

- Part 1: Environmental scan to investigate future implications for education and professional development
- Part 2: Constructing a collaborative institutional model for engineering professional development (CELM2008 Conference)
- Part 3: Corporatisation of management education for Engineers
- Part 4: Implementation and dissemination of project outcome

Embedding Innovation, Leadership and Sustainability principles into engineering management programs

- Part 1: Survey of existing engineering management programs
- Part 2: Develop flexible modal framework for course delivery
- Part 3: Develop enhanced engineering management courses
- Part 4: Dissemination of project outcome

How Engineers become CEO?

An Explorative Study into the careers of Australian business leaders who have an engineering/technologist degree (Annual Engineering Leadership Survey)

Thank You

