How to teach Health and Safety to Engineering Students?

RESEARCH SEMINAR

HUMAN FACTORS IN PRODUCTION SYSTEMS – THE VISION FORWARD

30/3/2016 Kirsten B. Olsen, CERgOSH, School of Public Health
What question to ask?

- Why teach engineers about health and safety?
- Do engineers influence health and safety?
- Which type of engineers?
- What approach to teaching health and safety?
Teach health and safety to Engineers because

They determine the work environment through

- Development of products
- Development of production processes
- Planning of production
- Management of production
Teach health and safety to Engineers because

They work as OHS professionals e.g. Safety engineers

• OHS management
• Identification and control of:
  – New hazards and risks
  – Existing hazards and risks
  – When injuries and illnesses occur
Strategies to improve the work environment?

Productions system
• Development of products
• Development of production process
• Planning of production
• Management of production

OHS management
• Identification and management of:
  - New hazards/risks
  - Existing hazards/risks
  - When injuries and illnesses

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Survey of engineers (Broberg, 2007)

- Do not perceive they influence the work environment
- Working environment is ranked as lowest importance
- Barriers for integration of work environment:
  - Time, knowledge and tools
Survey of engineers (Broberg, 2007)

- Strategies for integration of work environment:
  - Solidify knowledge on work environment (53%)
  - More time (32%)
  - Policy statement from Management (23%)
Engineer as technical specialist

Work environment

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Engineer as OHS specialist
Health and safety approaches

Causative/Origin Perspective

External Context
- Economy/competition
- Legislation
- Agreements
- Ideology
- Culture

Decision makers
- Employers
- Managers
- Technicians/engineers
- Worker representatives

Production process
- Technology
- Material
- Equipment
- People
- Work organisation

Consequence Perspective

Work environment
- Environment
- Physical demands
- Psychosocial demands
- Autonomy
- Corporation
- Working hours
- Wage structure

Consequences
- Accidents
- Work related injuries
- Work related disease
- Exclusion from labour market

Action Perspective

External Context

Decision makers

Production process

Consequence Perspective

Consequences

Action Perspective

Causative/Origin Perspective

External Context

Decision makers

Production process

Consequence Perspective

Consequences
Key players in the Value chain

**Designer**
- Product
  - Product description
  - Product design (Materials/Lifecycle)

**Developer Planner engeneers**
- Process
  - Production system and flow /level of mechanisation
  - Working method /labour intensity

**Engineer Managers Purchaser Employees**
- Work organisation
  - Flexibility / working hours
  - Skills development / Work roles / Autonomy

**Employee Manager HR manager**
- Individual
  - Skills and abilities
  - Physical and mental capacity
How to teach OHS to engineers?

Technical oriented

• Integrate determinants for creation of good job
• Illustrate how their decisions affect the work environment
• Illustrate the consequences of their decisions
• How to act in organisation in the political arena

OHS specialists

• Determinants for creation of good jobs
• Technology development and it’s affect on the work environment and peoples health
• The organisation as a political arena
• How to act in organisations in the political arena
The OHS framework used in New Zealand

Company and Working environment

- Competitors
- Customers
- Market share

- Decision-making process: Actors and processes

- Production
  - Employees
  - Machineries and tools
  - Organisation
  - Materials

- Exposures: Physical, Environmental, Chemical, Organisational, Psychosocial

- Consequences: Health and Wellbeing, Productivity, Economy, Quality...

- Suppliers: Available technology
- Labour market
- Employers org.
- Trade Unions
- Authorities: Dept. of: Labour, Education, Health
- OHS professionals

Competitors

- Health Sector: Hospitals, Doctors (GPs), Psychologists, Therapists

Customers

- Market share

Suppliers

- Available technology

Labour market

- Employers org.
- Trade Unions

Authorities

- Dept. of: Labour, Education, Health

OHS professionals

Suppliers

- Available technology

Labour market

- Employers org.
- Trade Unions

Authorities

- Dept. of: Labour, Education, Health

OHS professionals

Health Sector

- Hospitals
- Doctors (GPs)
- Psychologists
- Therapists

Compensation system

- ACC

Local community

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Levels of intervention

- Market
- Technology
- Regulation
- Work system design
- Individual modifiers
- Behavioural modifications
- System modifiers
  - National
  - Company

Products

Health effects

Thanks Per 30/3/2016
Thanks Per

Any questions?
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