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U/g mining engineering courses ⟷ Competencies for mine managers

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Minerals Industry Safety and Health Centre - MISHC

- Initiated in 1997 at UQ
- Industry funded centre
- Graduate and post-graduate courses - on-line
- Research
- Consultancy

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Professional Pathways - Aims

- Overall project
  - National competency model for key professional positions in mining and minerals
- Initial focus
  - Current situation of gaining qualification and developing professional competency

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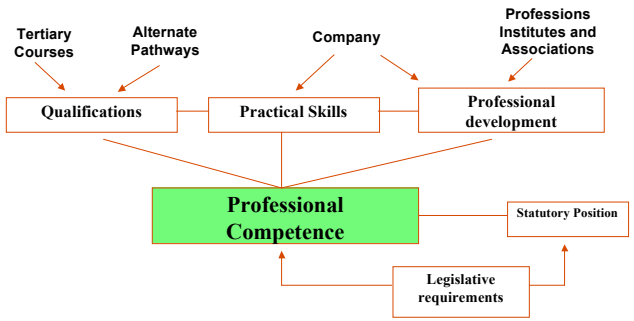
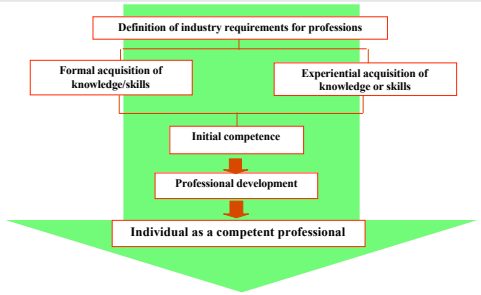
Information sought



Focus

- Map current initiatives and identify linkages and gaps
- Investigate and evaluate materials, courses and assessment processes for professionals

Focus



Mine Manager initiative as example of progression

What?

- Coal Training Package – MNC04
- Metalliferous Mining Training Package – MNM05
- Extractive Industries Training Package – MNQ03

What - 15 mandatory competencies

- Risk assessment and control system
- Environmental management system
- Statutory compliance management system
- OH & S management system
- Quality system
- Mine emergency preparedness and response
- Mine services System
- Mine infrastructure and plant systems
- Haulage, transport and production systems
- Blast system
- Ground control and mining systems – surface mines
- Ground control and mining systems – underground mines
- Ventilation
- Spontaneous combustion management plan
- Gas management system

Who is involved?

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Australian Courses

- MISHC
- MI Skills Centre (QMITAB)
- Overseen by a committee from mining industry

South African Courses

- MISHC
- NRM
- Industry input

When and where?

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- Compares the 2004/2005 u/g courses
- Includes information from:
  - The University of Queensland
  - The University of New South Wales
  - The Western Australian School of Mines (Curtin University)
  - The University of Ballarat
  - The University of Wollongong

When and Where?

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South African Universities

- Pretoria
- Johannesburg
- Witwatersrand

Using the same process and tools

Comments

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- Based on 2004/2005 courses and assessment – will change over time
- Not definitive study
- Not judgement on quality or suitability of any course
- Information to be reviewed in 5 years or if major course/legislative/industry changes

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How?

- Differences between University courses and competencies
- Mapped against
  - Required knowledge
  - Required skills
  - Range of variables for South Africa
- Standard template developed
  - Subject covering
  - Hours allocated
  - References used
  - Assessment processes

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Standard template

Required knowledge or skill	Course Content			Assessment					
				Written			Practical		
	Subject	Time	Reference	Project	Short answer	Multi-choice	Pract	Field work	Simulation
Emergency response and evacuation planning processes and techniques									
Product haulage and transport equipment and systems – types, uses etc									

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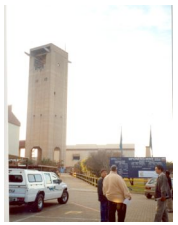
How?

- Unis supplied written subject and course outlines
- Partially completed map drafted
- Visit to Uni to complete map
  - Written
  - Practical
  - Field work



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Comparison across Unis

- Comparison table prepared for each competency unit

Required knowledge or skill	UNSW	UQ	UoW	WASM	UB
Occupational health and safety legislation, policies and codes of practice	√	√	√	√	√
Audit occupational health and safety systems and recommend strategies for improvement					

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How?

- Identification of areas covered/not covered by courses
- Needed to be covered by at least 50% of the courses

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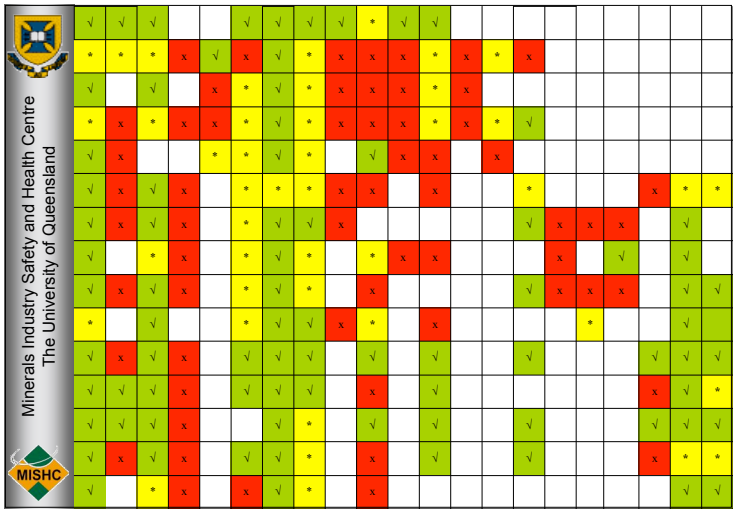
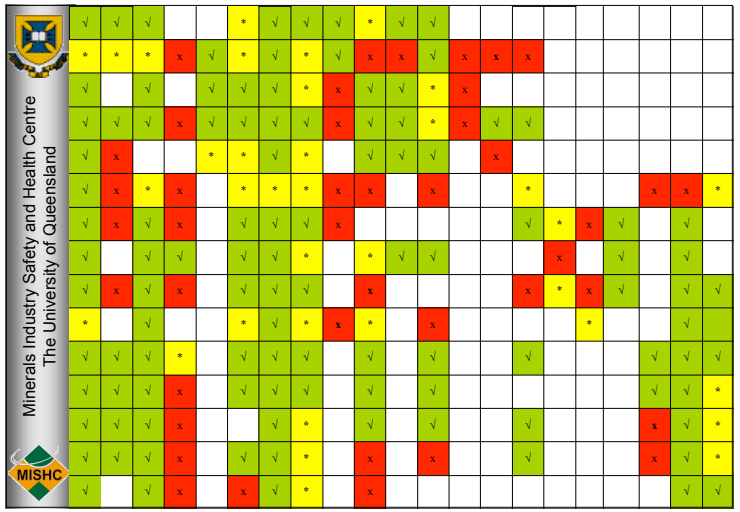
Example of results

Competency	Auditing	Statutory/ legal needs	Training needs	Consultation/ negotiation/ communication
Risk assessment systems	x	√		√
Infrastructure and fixed plant		√	x	x
Stat compliance systems		*		√
OHS management systems	x	√	x	*
Ground control - surface	*	√	x	√
Ventilation	√	√	x	√





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Findings

- Aim and content of courses similar
- Technical content similar
- Differences in cultures evident – both University and country
- Need to take into account site and company issues

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Comparison

- Risk Assessment – generally covered by all courses
- Environmental management – not well covered
- Statutory compliance – covered more comprehensively in SA
- OHS management – covered more comprehensively in SA - particularly management skills
- Quality systems – similar to OHS
- Emergency systems – not well covered in any course

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Comparison

- Mine Services - similar
- Infrastructure and fixed plant – SA courses more management
- Haulage and transport – similar
- Blast systems – similar
- Ground control - similar
- Ventilation, gas management and spontaneous combustion - similar

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Comments and Recommendations

Universities

- Substantial equivalency of programs – Washington Accord
- Limitation in terms of knowledge and skills – not a shortcoming of course
- Generic skills in management systems – apply across systems
- Planning and monitoring of work experience to allow identification of skills

Comments and Recommendations

Industry

- Detailed career development for graduates
- Aligning the qualifications and/or competencies required for statutory qualifications
- Transferability of knowledge and skills
  - Sectors
  - Regions and nationally
  - Internationally

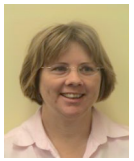
Comments and Recommendations

Board of Examiners

- South African degree/higher diploma acceptable qualifications
- Time to familiarise with Australian conditions – 6 months
- Similar areas to gain competencies
  - MNCG1003A – Establish the risk management system
  - MNCU1151A – Establish mine emergency preparedness and response systems
  - MNCU1102A – Establish the spon comb management plan
- National diploma needs additional studies and development

Thanks

- Co-operation and assistance of the Uni staff
- Information and time generously and freely provided



Report on www.mishc.uq.edu.au