

Embedding Safety Education in Existing Academic Curricula

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Calls to Improve Safety Education

“While a vast number of references, standards and guidelines have been developed to describe and promote different types of hazard evaluation methodologies in an industrial setting, similar resources that address the unique cultural and dynamic nature of an academic laboratory setting have not been generated.”

US Chemical Safety Board (2011)

Changing Safety Culture



Calculated and consistent long-term effort



Clear communication of rationale and benefits of behaviors



Modelling of the behavior by all



Clear and certain accountability and reinforcement of behaviors

Diapositive 3

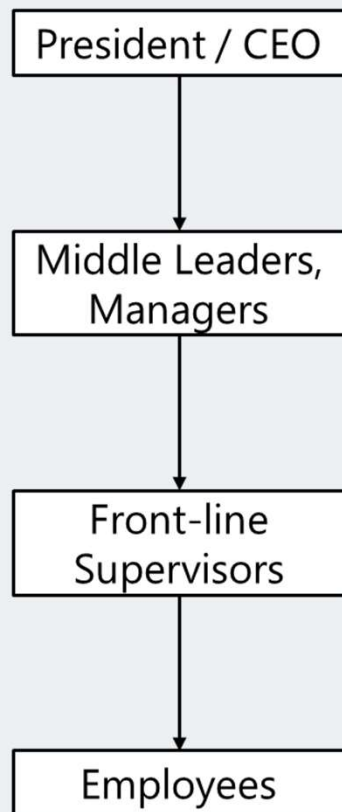
JC5

Do we have a source for this model?

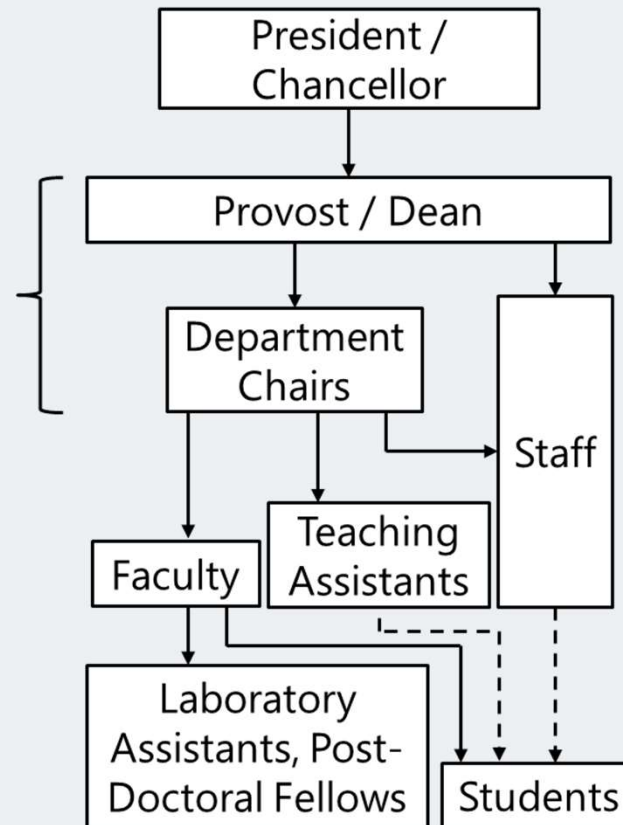
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Leadership in Business vs. Academia

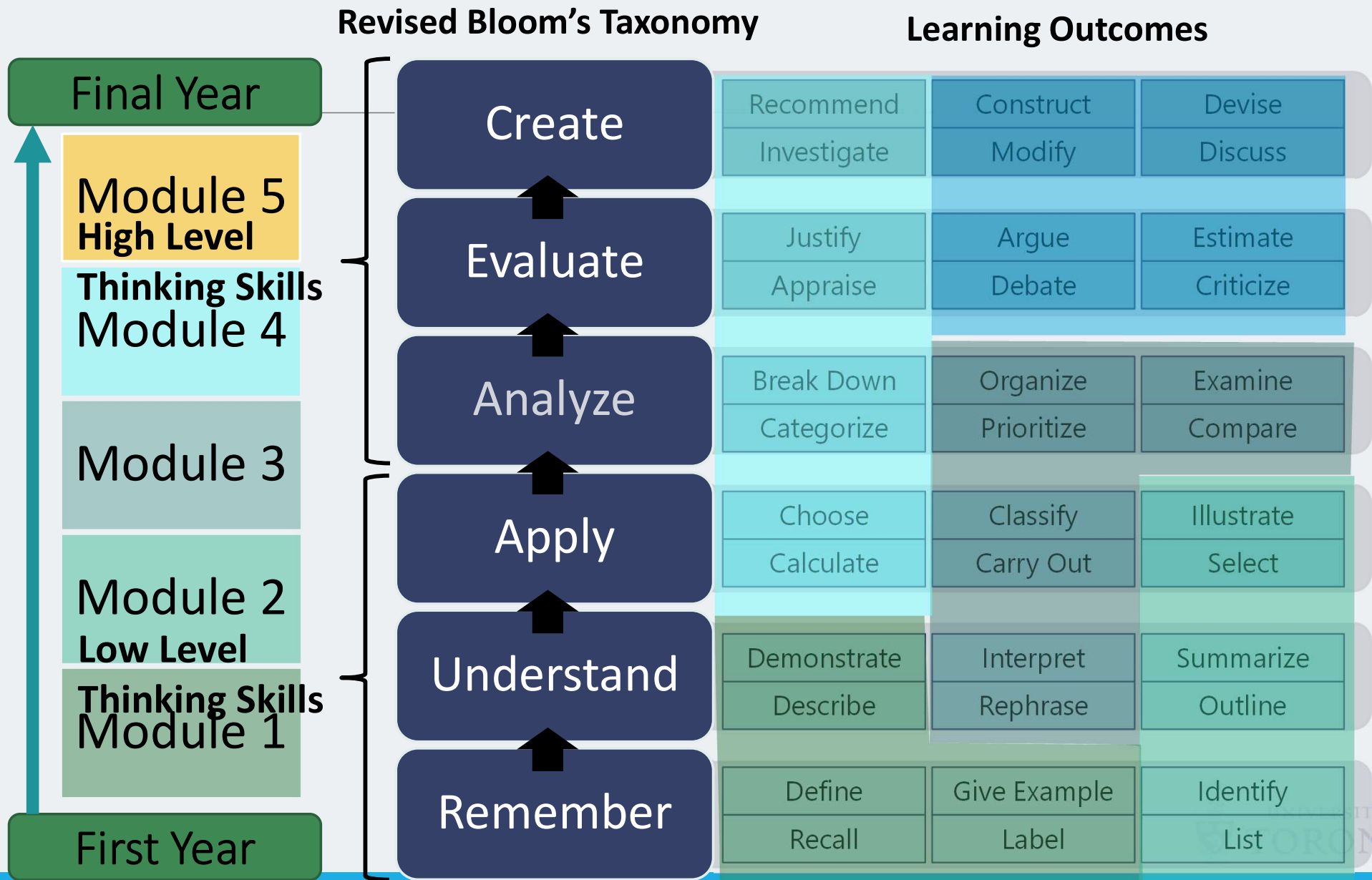
Business Model



Academic Model



Curriculum Design for Higher Bloom's Level



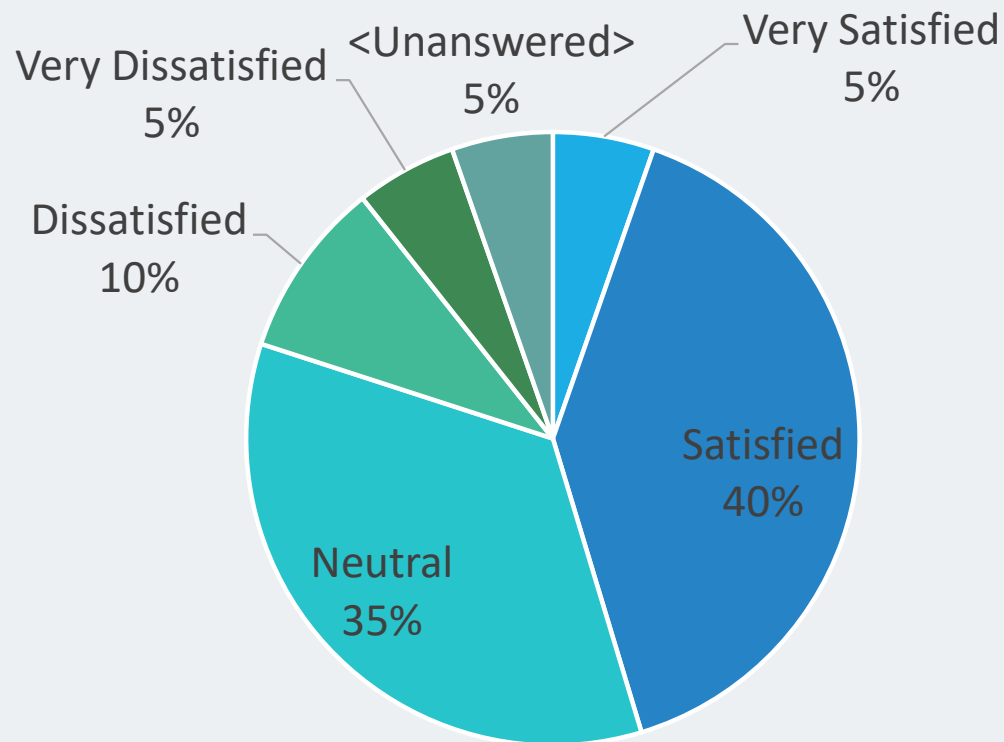
Diapositive 5

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Student Satisfaction with 2018 Rollout of eLearning Content

Student Overall Satisfaction with the Learning Experience



Wide Array of Content and Sources

SME Sponsor or Source	Learning Modules
PSHSA	Worker Health and Safety in 4 Steps
	Health and Safety for New Professionals
Minerva Safety Management	Hazard, Risk, and Controls
Canadian Standards Association	How to Read Standards and Codes
Compressed Gas Association	Compressed Gas Safety
Energy Safety Canada	Process Safety Awareness
Government of Ontario	The Code and the AODA
University of Toronto	Mental Health – Identify, Assist, Refer
IChemE	Safety Centre Case Studies
Source	Videos Encapsulated in eLearning Module
Bread and Roses Creative Productions	Town of Widows
US Chemical Safety Board	Experimenting with Danger
Global Eagle Productions	Deepwater Horizon
British Broadcasting Corporation	One Night in Bhopal

Example Interactive Content

Reading the Act - Learning Activity

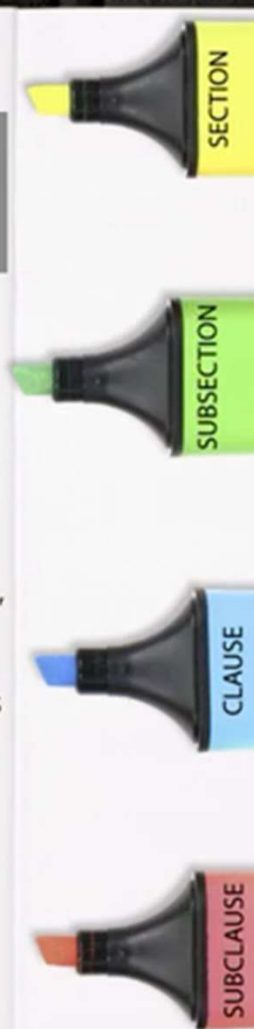
Drag the YELLOW highlighter over the SECTION identifier. Drag the GREEN highlighter over the SUBSECTION identifier. Drag the BLUE highlighter over the CLAUSE identifier and drag the PINK highlighter over the SUBCLAUSE identifier.

29. (1) **Duties of owners** - The owner of a workplace that is not a project shall,

- (a) ensure that,
 - (i) such facilities as are prescribed are provided,
 - (ii) any facilities prescribed to be provided are maintained as prescribed,
 - (iii) the workplace complies with the regulations, and
 - (iv) no workplace is constructed, developed, reconstructed, altered or added to except in compliance with this Act and the regulations; and
- (b) where so prescribed, furnish to a Director any drawings, plans or specifications of any workplace as prescribed.

(2) **Mine plans** - The owner of a mine shall cause drawings plans or specifications to be maintained and kept up to date not more than six months last past on such scale and showing such matters or thins as may be prescribed.

[SEE EXAMPLE](#) [SHOW ALL](#)



Example Accessible Video Content



Deployments to Date

Design Courses

Safety Training
Courses

Technical Electives

Graded vs.
Ungraded/Optional
vs. Mandatory

New content vs.
refreshers

CHE499Y1 Y TUT0101 > Modules

2019 Fall-Winter

Export Course Content

Academic Integrity

View Course Stream

View Course Calendar

To Do

- Research Registration For... Oct 11 at 3:05pm |
- Research Registration For... 5 points | Oct 15 at 3pm |
- Further Context - Quercus... Oct 16 at 6am |

Deliverables

- Research Registration Form Submission Oct 15 | 5 pts

Course Documents

- CHE499_Syllabus_2019v1.pdf

Quercus Site Orientation

- Quercus Orientation Video.mp4

CHE499 Safety Training Complete All Items

- UToronto Environmental Health and Safety (EHS)

Three Key Challenges

1. Finding Material
2. Finding a Place in the University System
3. Implementing

Challenges of Finding Material

Identifying partners and in-house champions—

- What groups have content?
- Who within that group controls distribution?

No one place or organization will have everything you need

Being open to a wide range of partners – government regulators, private enterprise, non-profits, libraries, media/entertainment companies

Copyright must often be negotiated

Opportunities: We have found great approaches and content that we never even realized existed!

Challenges of Finding a Place in the University System

Identifying partners and in-house champions

- What courses will benefit and what instructors are most open to change?
- Knowing the organizational structures: is safety training part of design courses? Lab courses? Separate seminars or workshops?

Stakeholder buy-in – even when giving instructors free content

Embedding in a course structure so the change will persist beyond the current instructor

Opportunity: Highly relevant across departments and faculties, so can find allies and leverage resources from across the institution

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Challenges of Implementing

Assessment – Often at a Grade 10 level, True/False or Multiple Choice, lowest levels of Bloom’s Taxonomy - the students can guess the answers without doing the content

- We are finding it best to make our own assessments instead of using those as given

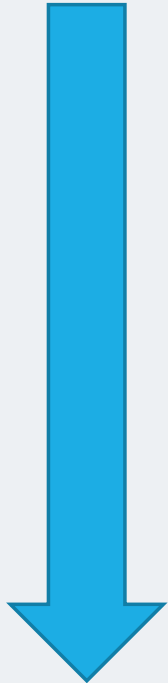
Tying the modules together from different sources

- Curriculum maps are helpful (when they exist) to facilitate learners getting the right information when they have been primed with appropriate context
 - An area of future focus for organizing our growing content collection

Opportunity: Learning Management Systems are already in place and provide a solid platform for content delivery

Flexibility of Partnerships

Increasing partner engagement and resources



Partner Content Available	Can be transformed to
Videos/Podcasts	Participation mark for watching/listening
Presentations	Interactive eModules
Workshops	Workshops or eModules
Existing eModules	Usable as is or adapt to university student audience
Enthusiastic SME	New modules from scratch

Diapositive 15

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Source content to usable content conversion

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How to Get Involved if you are:

In Industry

- Identify training content used in your organization
- Connect with colleagues in academia
- Universities are happy to sign licenses to use your content. They do not want to maintain it but will gladly use it if offered

An Educator

- Identify gaps in student learning, especially related to application
- Connect with colleagues in industry
- Be willing to add your own evaluation or assessment elements

Learn from Our Experience

- Talk to us during the conference or get in touch afterwards by email – no need to reinvent the wheel

Questions?

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