Curriculum Mapping Experiences at University of Waterloo

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Topics

- What is curriculum mapping and why a recent increase in interest?
- Benefits of curriculum mapping
- Processes & Tools used at UW
- Challenges
- Lessons Learned
- What Next?

What is Curriculum?

- **Curriculum:**
  "a sophisticated blend of educational strategies, course content, learning outcomes, educational experiences, assessment, the educational environment and the individual students' learning style, personal timetable and programme of work ." (Harden, 2001)

What is Curriculum Mapping?

- "**Curriculum mapping** is a spatial representation of the different components of the curriculum so that the whole picture and the relationships and connections between their parts are easily seen." (Harden, 2001)

Why the Interest in Curriculum Mapping?

- UDLE implementation
- Program Reviews
- UW policy for syllabus requirements
- Other factors
  - strategic planning (ENV)

Benefits of Curriculum Mapping

*"The key to a really effective integrated curriculum is to **get teachers to exchange information about what is being taught and to coordinate this so that it reflects the overall goals of the school**."*

*"Mapping not only assists with planning and implementation of the curriculum but importantly **helps to raise the level of discussion and reflection about the curriculum and resource allocation."***

(Harden, 2001)

Various Perspectives

- expected learning outcomes
- content or areas of expertise covered (& gaps)
- student assessment
- learning opportunities
- learning location
- learning resources
- timetable
- staff
- curriculum management
- students

(Harden, 2001)

Process

- Invited/asked for assistance
  - curriculum review committee
    - junior and senior faculty members
    - staff (CTE, recruitment, co-op, library, registrar's office)
- Departmental retreat or workshop
- Focus groups, surveys or "town halls"
  - instructors
  - students
  - co-op employers
  - professional Associations

Process

- Iterative
- Varies by Department / Faculty
  - one day departmental retreat
  - 2h workshop with faculty and students
  - 2h meeting with Director and co-op student
  - independent process (no CTE involvement)
  - ENV faculty-wide process
    - serve on curriculum review committee

Tools

- Flipcharts
- Post-it notes
- Whiteboards/Blackboards
- Laminated "year at a time" calendar
  - portable whiteboard grid

Tools

- Excel, Word
- Database (e.g. Access, Filemaker)
- VUE - Visual Understanding Environment
  - FREE concept mapping software created by Tufts University (http://vue.tufts.edu/)
- CurricKit (Beta pilot with U of G)

Process

- brainstorm ideal graduate
  - terms/language faculty are comfortable with
- map ideal graduate attributes to UDLEs
- cluster attributes & map to courses
  - intro, reinforce, emphasize
- examine courses in more detail
- align objectives/attributes/competencies with activities and assessments

Process

Key Knowledge	100	101	200	201	300	301	302	400	401	402	403	310	210	100	101	200	201	300	301	302	400	401	402	403	310	210	Key Methods
Cartographic design (Quantitative)		R															R		R								
Projections, co-ord systems		I	R	R										I		R	R	R	R	R	R	R			R	I	Map creation
Map interpretation	I													I	R				R								Visualize data
Spatial modeling - analytic			I		RE												R	R		R	R		E	R			Map interp.
Spatial analysis - predictive			I	I	RE												R	IR		R	R						Written presentation
Spatial analysis - prescriptive			I					IR								I	R	R	R	R	E	E	E	R			Oral presentation
Database design			I			E		R	R		E					I			R		R						Critical thinking
Phys. princ. Of R.S.				I			R			E				I				R		R			R	E	R		Interpolation
Image processing			I			R			E								R		R		R	R		R			Regression
Applications of RS			I			R			R								I		R				R				Lit review*
Spatial autocorrelation				IR						I							I		R								Apps of RS
Spatial sampling		I	I			R			R								I	I		R			I				Surveying
Scale	I		I	I	I	R			R			I					I		R			E				Field validation
Temporal analysis						I	I	I		I							I		R		E	E		E			Image processing
Non-spatial data analysis	I			IR						IR	I						I		R		R					I	CIS analysis
Apps of CIS		I			R		E	E						I	I	I	I				E	E	E	E	E		Stats software
Project management				I					I	E										R				E			Truthiness
Air photo																											
Geod./surveying																											
Computer literacy	I	I					R													R							

Process

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Projections, co-ord systems			R	R									
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Applications of RS				I			R			R			
Spatial autocorrelation					IR								I
Spatial sampling			I	I			R			R			
Scale		I		I	I		R			R			
Temporal analysis						I	I	I		I		I	
Non-spatial data analysis	I				IR							IR	I
Apps of CIS			I			R		E	E				
Project management					I					I	E		
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Process

	100	101	200	201	300	301	302	400	401	402	403	310	210	Key Methods
		I	R			R		R						
	I	I	R	R	R	R	R	R	R	R		R	I	Map creation
		I	R			R								Visualize data
					R	R		R	R		E	R		Map interp.
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Process
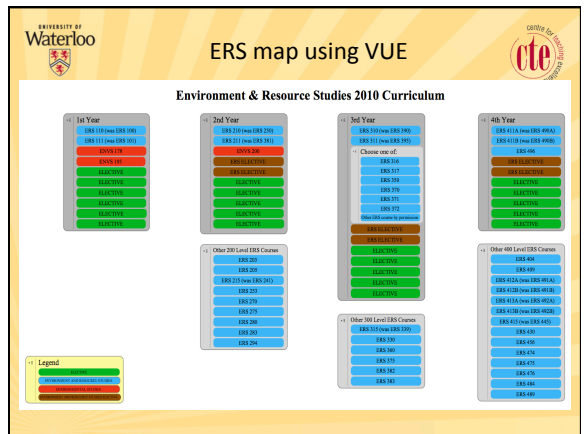
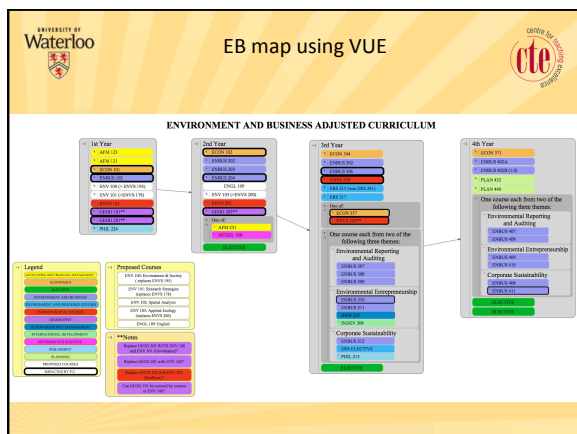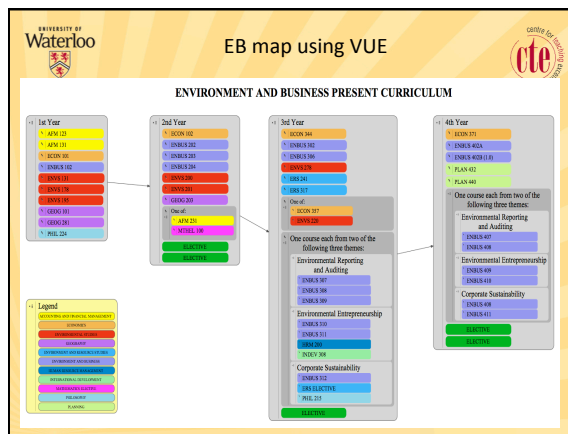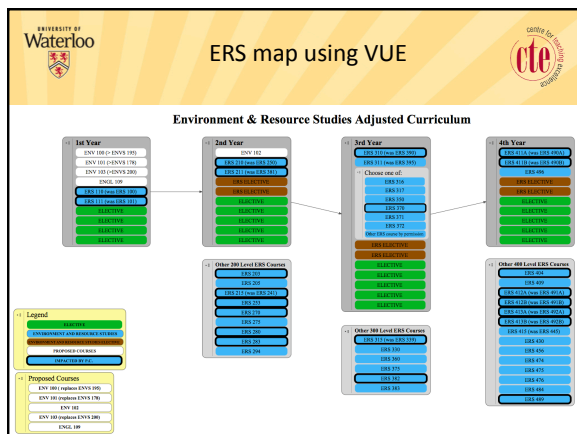**Please complete a separate survey for each course you teach**

Course Number: _____

Instructor: _____

PART A: Please indicate if this course gives students no, some or much opportunity to do the following (if an opportunity is provided, please explain).

1. Gain research experience — No ____ Some ____ Much ____
2. Think critically — No ____ Some ____ Much ____
3. Evaluate the appropriateness of different methodologies — No ____ Some ____ Much ____
4. Use appropriate methodologies — No ____ Some ____ Much ____
5. Critically evaluate qualitative information — No ____ Some ____ Much ____
6. Critically evaluate quantitative information — No ____ Some ____ Much ____
7. Use scholarly research and primary data — No ____ Some ____ Much ____
8. Apply concepts, principles and techniques of analysis — No ____ Some ____ Much ____
9. Enhance their writing skills — No ____ Some ____ Much ____
10. Enhance their oral presentation skills — No ____ Some ____ Much ____
11. Become aware of the limits of their own knowledge and ability — No ____ Some ____ Much ____
12. Work with others — No ____ Some ____ Much ____
13. Engage in self-directed learning — No ____ Some ____ Much ____
14. Learn skills that are transferable — No ____ Some ____ Much ____
15. Translate experience into learning — No ____ Some ____ Much ____
16. Become aware of what constitutes ethical behaviour — No ____ Some ____ Much ____
17. Become aware of global diversity — No ____ Some ____ Much ____

Process – ENV Faculty-wide

- 2h workshop with ENV curriculum review committee
  - brainstorm ideal graduate & map to UDLEs
- 5 new common courses proposed
- workshop to flag courses impacted
- map current and future curriculum of each department (VUE)
- "Town Halls" to solicit student feedback

ERS map using VUE

Environment & Resource Studies 2010 Curriculum

ERS map using VUE

Environment & Resource Studies Adjusted Curriculum

EB map using VUE

ENVIRONMENT AND BUSINESS PRESENT CURRICULUM

EB map using VUE

ENVIRONMENT AND BUSINESS ADJUSTED CURRICULUM

Tools – VUE

What have we found it useful for?

- as a visual representation tool
- Illustrate course sequencing
- show impact of new courses
- show the differences between various programs (comparison tool)
- easily show breadth of courses across a curriculum (example: EB vs. ERS)
- show relationship of courses across a curriculum

Tools – VUE

Challenges

- mapping certain programs - specifically where there are less required courses (KI, Arts)
- some of the functions of the program (no copy/paste into certain sections, bad highlighting in search function)
- new, unfamiliar program for users
- can export to HTML but not very elegant

Tools - CurricKit

- survey and curriculum mapping software developed by University of Guelph
- align knowledge, skills and values (ideal grad attributes) to instructional activities and assessments
- Pilot and beta testing

Tools - CurricKit

- instructional approaches
- assessment approaches
- distribution of assessments (workload)
- what is taught/assessed vs. not taught/not assessed
- level of learning expected (Bloom)
- mapping to UDLEs

What is your process and associated challenges?

Challenges

- threat to instructor autonomy (perceived)
- labour intensive (time)
- new process / talking with other instructors
- new, unfamiliar software (training, different levels of tech proficiency)

Challenges

- "ideal" vs. minimally acceptable
- interpretation of terms used
- how to assess :
  - *"behaviour consistent with academic integrity and social responsibility"* (UDLE 6c)
  - *" articulate learning from experiential or applied opportunities"* (UDLE 7)
  - *demonstrate an understanding of the intellectual, social, cultural, and political diversity of the world in which we live"* (UDLE 7)
- ePortfolio (PLOT)

Challenges

- snapshot in time
  - if class size increases, can't do same activities
  - courses are instructor dependent
- how to account for past courses or future courses?

Factors impacting the process

- Faculty buy-in
  - Getting everyone in one place at one time
  - Ensuring they understand why they are doing this

Strategies

Factors impacting the process

- Department resources and assigned responsibility for distributing and compiling information
  - ownership by dept/faculty

Factors impacting the process

- Information collected and presented in a format that meets needs of stakeholders
  - mapping 'required courses' delivered by other departments
  - mapping new courses that haven't been developed or taught

Factors impacting the process

- User friendly & flexible tools (customizable)

Lessons

- depends who shows up / participates
- catalyst for discussion
- iterative process
- if faculty buy-in (own the process), there's a better chance of success

What's Next?

- mapping courses to UDLEs
- using UDLEs and mapping for continuous improvement
- researching impact of mapping

References

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Sumsion, J. and J. Goodfellow (2004). "Identifying generic skills through curriculum mapping: a critical evaluation." Higher Education Research & Development 23(3): 329-346.