

Cómo Diseñar un Currículo Basado en Resultados de Aprendizaje (Designing an Outcomes-Based Curriculum)

Día 2: Diseño del Currículo
(Day 2: Curriculum Design)

Universidad Católica de la Santísima Concepción



Doris R. Brodeur, Ph.D.
dbrodeur@mit.edu

Agosto 2009

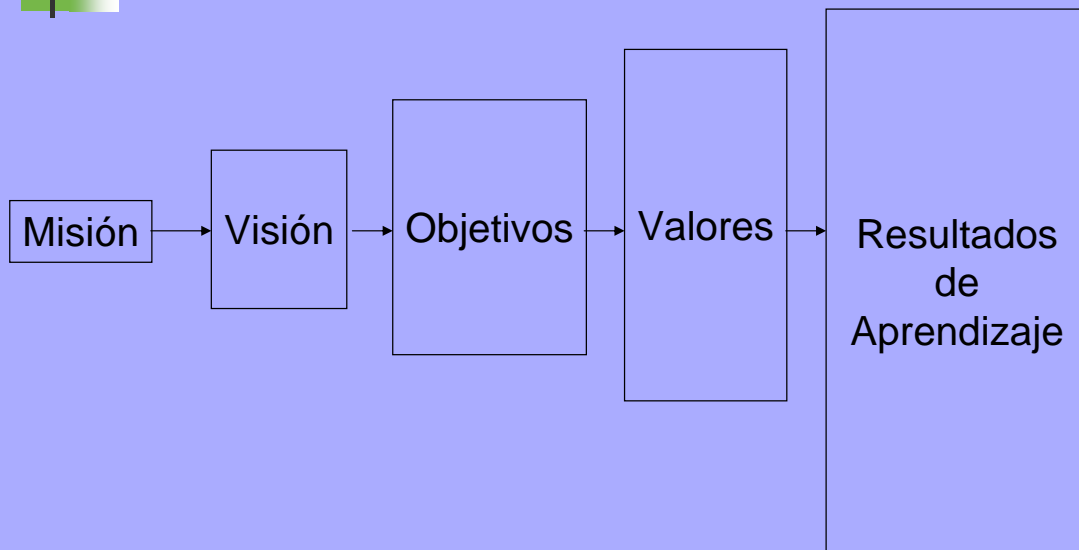
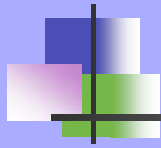


Objetivos

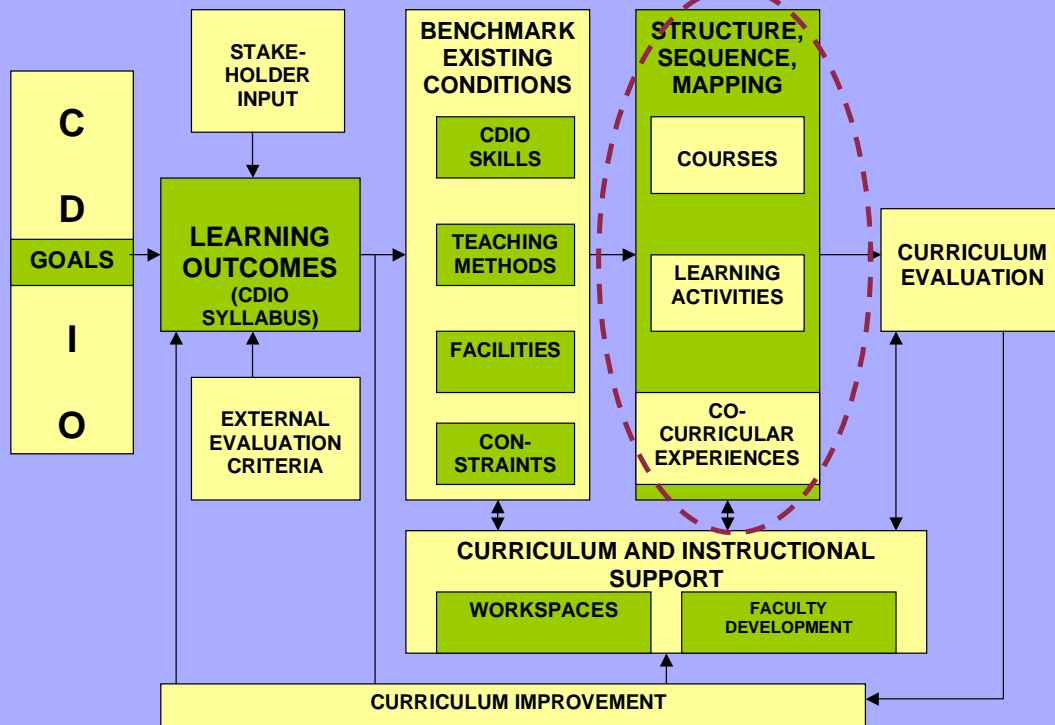
- Diseñar un currículo que integre los resultados de aprendizaje personales, interpersonales y profesionales con los resultados técnicos disciplinarios
- Mapear en una estructura curricular existente los resultados de aprendizaje deseados
- Ingegrar los resutados de aprendizaje deseados a nivel del curso

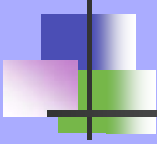
Review:

Learning Outcomes Derived From Mission, Vision, Objectives, and Values



A Curriculum Development Model



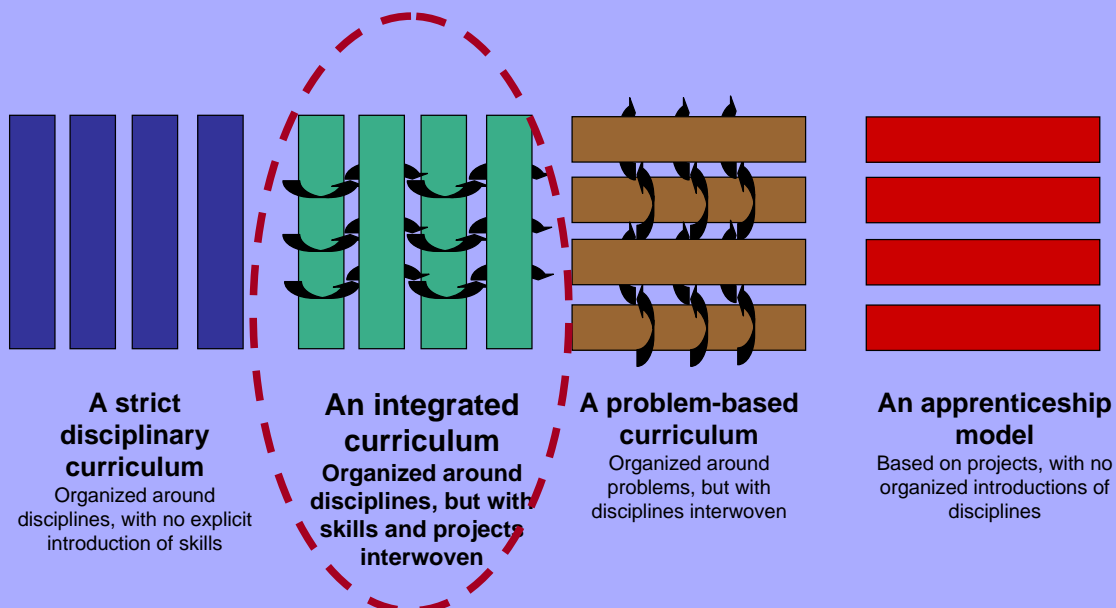


Curriculum Design Components

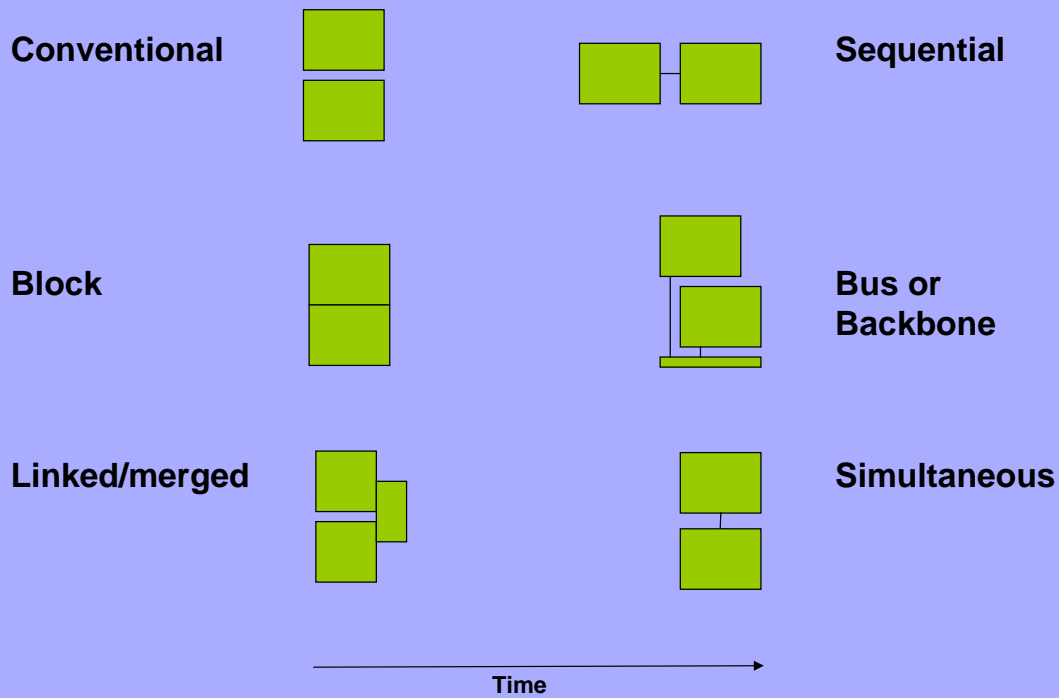
- **Program learning outcomes** aligned with mission, vision, objectives and values, and validated by program stakeholders
- **Curriculum structure** organized around the disciplines, with skills and projects interwoven
- **Sequences** of learning experiences
- **Mapping** of personal, interpersonal and professional competencies onto the curriculum structure
- **Integration** of personal, interpersonal and professional competencies into courses

Sample Curriculum Structures

(Disciplines run vertically; projects and skills run horizontally.)

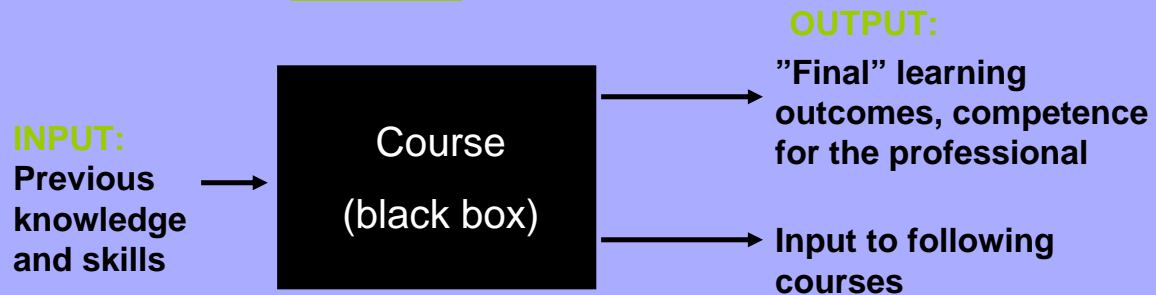


Sample Course Linkages



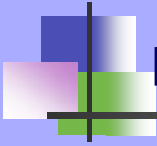
Sequencing The Curriculum

THE BLACK-BOX EXERCISE



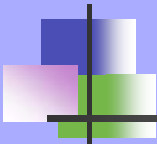
All courses or modules in the program are presented through their input and output only

- Enables efficient discussions
- Makes connections visible (as well as lack thereof)
- Serves as a basis for improving coordination between courses



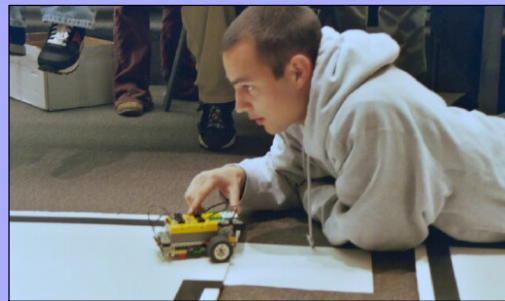
Methods to Integrate Learning Outcomes

- ❑ For each outcome, identify specific tasks.
- ❑ Decide the best sequence to teach each task, from simplest to most complex activities
- ❑ Interview course instructors to determine which learning outcomes are already included in their courses
- ❑ Assign each task or learning outcome to specific courses in the curriculum. More than one course can include a specific task; some courses will not have any tasks for a specific learning outcome
- ❑ To get buy-in from all faculty, it may be useful to schedule a retreat or discussion day in which the main focus is to get agreement on which courses will address which learning outcome. (It is important to look at the curriculum as a whole to see if you are introducing and teaching a learning outcome *before* you expect students to use the skills.)
- ❑ Create a matrix to summarize the integration of the learning outcomes into the courses in the curriculum for each program, including common courses.

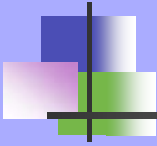


Sample Sequence: Pensamiento crítico

- Articulate the critical thinking process
- Identify assumptions, criteria, and evidence to make informed decisions
- Evaluate alternative perspectives, contexts, and the quality of evidence in making informed judgments
- Examine and cultivate a personal value system to make informed decisions



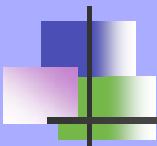
Massachusetts Institute of Technology



Sample Sequence: Comunicación efectiva



- Write short, individual structured reports; create sketches, charts, and simple graphics; practice simple interpersonal communications
- Write and present individual or small-group short reports, e.g., lab reports
- Create discipline-specific graphics
- Write large individual or collaborative reports of conference quality; present collaborative oral reports of conference quality; use appropriate research resources; implement appropriate communication strategies based on the requirements of diverse audiences
- Write large collaborative reports for technical briefings; present collaborative oral technical briefings; use appropriate research resources; implement appropriate communication strategies based on the requirements of diverse audiences



Sample Sequence: Liderar y trabajar en grupos



Duke University

- Organize small short-term to semester-long teams for learning; teach simple planning, scheduling, and facilitation; introduce team evaluation and problem-solving
- Organize small short-term to semester-long teams for learning; teach team evaluation and problem-solving
- Organize medium-sized project teams for half to a full semester; require deliverables from teams
- Organize larger project teams for a full, or multiple semesters, focused on deliverables; teach leadership skills, complex negotiations, evaluation and problem solving

Integrated Curriculum Design

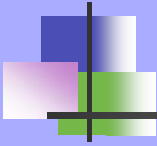
Universidad Tecnológica Centroamericana (UNITEC), Honduras

Asignatura	Habilidades y Atributos Personales																																						
	2.1			2.2			2.3			2.4			2.5			2.6			2.7			2.8			2.9			2.10			2.11								
	I	E	A	I	E	A	I	E	A	I	E	A	I	E	A	I	E	A	I	E	A	I	E	A	I	E	A	I	E	A	I	E	A	I	E	A	I	E	A
Algebra	x	x	x																																				
Administracion 1																																							
Español				x																																			
Ofimatica 1																																							
Geomet. Trigonom.																																							
Intro. Ing. Industrial																																							
Historia de Honduras																																							
Ofimatica 2	x																																						
Calculo 1 Diferencial																																							
Quimica General																																							
Sociologia																																							
Ofimatica 3																																							
Calculo 1 Integral	x																																						
Analisis Contable 1	x																																						
Elect. Arte/Deporte																																							
Idioma 1																																							
Calculo 2 Geom. Analit.	x	x	x																																				
Algebra Lineal																																							
Mercadotecnia 1	x																																						
Idioma 2																																							
Ecuac. Diferenciales																																							
Analisis Contable 2																																							
Fisica 1																																							
Idioma 3	x	x																																					
Estad. Matematica 1																																							
Dibujo Tecnico																																							
Fisica 2																																							
Idioma 4																																							

Integrated Curriculum Design

Massachusetts Institute of Technology

	Unified		Core		PAS		Capstone Courses									
	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	
2.1.1 (4.4) Problem Identification and Formulation			●			●										Utilize if desired
2.1.2 (4.3) Modeling			●			●	●									Utilize if desired
2.1.3 (4.0) Estimation and Qualitative Analysis			●		●			●								Utilize if desired
2.1.4 (3.7) Analysis with Uncertainty			●	●				●								Utilize if desired
2.1.5 (3.8) Solution and Recommendation								●	●	●				●		
2.2 Experimentation and Knowledge Discovery	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	
2.2.1 (3.4) Hypothesis Formulation						●										Utilize if desired
2.2.2 (3.0) Survey of Print and Electronic Literature						●							●			
2.2.3 (3.6) Experimental Inquiry						●							●			
2.2.4 (3.3) Hypothesis Test, and Defense			●			●										Utilize if desired
2.3 System Thinking	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	
2.3.1 (2.9) Thinking Holistically						●										
2.3.2 (2.6) Emergence and Interactions in Systems						●							●			
2.3.3 (2.7) Prioritization and Focus						●							●			
2.3.4 (2.9) Trade-offs, Judgment and Balance in Resolution						●							●			
2.4 Personal Skills and Attitudes	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	
2.4.1 (3.4) Initiative and willingness to take risks						●										
2.4.2 (3.4) Perseverance and flexibility																Utilize if desired
2.4.3 (3.6) Creative Thinking						●										
2.4.4 (3.8) Critical Thinking						●							●			Utilize if desired
2.4.5 (3.4) Awareness of one's personal knowledge, skills and attitudes						●							●			Utilize if desired
2.4.6 (3.1) Curiosity and lifelong learning																Utilize if desired
2.4.7 (3.4) Time and resource management						●										Utilize if desired
2.5 Professional Skills and Attitudes	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	T ¹	T ²	I	
2.5.1 (3.7) Professional ethics, integrity, responsibility & accountability						●							●			
2.5.2 (2.7) Professional behavior													●			
2.5.3 (2.7) Proactively planning for one's career													●			
2.5.4 (2.9) Staying current on World of Engineer													●			



Resources for Curriculum Design



Faculty Planning Time

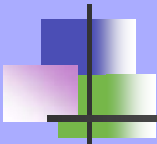
- 2 to 4 daylong retreats per year
- 1/4 release from workload per semester

Leader Time

- 1/2 workload at least for the first two years

Financial Resources

- Instructional support staff (curriculum, instruction, assessment)
- Graduate and undergraduate teaching assistants
- External consultants



Exercise: Curriculum Mapping



- Work in groups of 3 or 4 from different program areas
- Assign each group a part of the list of learning outcomes for the Computer Science program
- Each group will allocate its respective outcomes to the courses in the program
- When that task is complete, the whole group will collect the groups' allocations and map them onto the courses in the Computer Science curriculum

Summary: Agree Or Disagree?

SD = Strongly Disagree; **D** = Disagree; **N** = Neither disagree nor agree;
A = Agree; **SA** = Strongly Agree

	SD	D	N	A	SA
An integrated curriculum design process can be carried out in many different ways.					
Program leader support and resources are desirable, but not required.					
Support and commitment for the change process are needed from all stakeholder groups.					
Active student participation in all phases fosters creative ideas and facilitates implementation.					
Monitoring of programs and achievements needs to be regular and consistent.					