Curriculum Mapping – A Primer

Curriculum mapping is a method of articulating where, when, and how individual courses support students' achievement of learning outcomes for a program. The curriculum mapping process can help a department gather information about their program, refine the program-level outcomes, pinpoint redundancies and gaps in a program, highlight courses that are over/under-utilized, and identify courses that are disconnected from a program. In essence, a mapping exercise can help answer the questions "what does our program currently have/do?" and "what might our curriculum need?"

The purpose and scope of a curriculum mapping exercise should be determined before collecting information. To help with determining the purpose and scope of the mapping process, ask yourself:

What information are we interested in collecting?

This can differ depending on the purpose and scope of your mapping. You may only be interested in course and program outcomes, or you may be interested in a more detailed analysis that includes examining methods of instruction, assessment, and feedback in individual courses. You should also decide if you are interested in looking at all courses within the program, only core/required courses, specializations within a program, specific program years, or some other combination of courses that are of particular interest. *Unless you are looking at a specific subset of courses, the bare minimum for a program-level mapping exercise is to include all required courses.*

Where will we get the information that we need?

There are a number of potential sources for gathering this information, including individual course instructors, course syllabi, current students, alumni, employers, and accreditation bodies. *Typical sources when interested in reviewing the intentions of the curriculum are course instructors, syllabi, and student feedback.*

How will we gather the data?

A good starting point is to look at the content of the course syllabi. Workshops, retreats, interview, surveys, or focus groups with instructors are also ways to gather information about an individual course. If there are several instructors for a course, you may need to determine who will do the mapping. Is there a lead instructor or coordinator to guide the process? Or an instructor who teaches it most frequently? If there is variation across sections, is there one section that is the most typical of all sections? Variations in sections may require that you map all sections individually and compare them to determine the average student experience in the course.

If you are asking several instructors to complete a mapping exercise, provide them with clear instructions including any definitions and examples relevant to any scale you are using. This will provide you with a more accurate description of your program. Please note that program evaluation, quality assurance, and quality improvement activity is exempt from research ethics review.

How to Complete the Mapping

There are a few options when it comes to compiling your mapping data. Commonly used options include online-tools (e.g. Curriculum Links, surveys) and an Excel template. Online tools are specifically designed for mapping and provide a standard report of your results; however, they offer less flexibility than a spreadsheet that can be populated and edited by a large group of people over time.

Program Map	SCI 1000		SCI 2000			SCI 2100		
	Outcome A	Outcome B	Outcome A	Outcome B	Outcome C	Outcome A	Outcome B	Outcome C
Program Outcome 1	x			x				
Program Outcome 2			x					
Program Outcome 3					x			x
Program Outcome 4						x	x	
Program Outcome 5				x				

Figure 1: Example of a curriculum map created using an Excel template. Program-level outcomes are listed down the first column and course-level outcomes for individual courses are listed along the top of the map. In this example, alignment between program- and course-level outcomes is indicated by a simple "x". Please see "Indicating Alignment and Mapping Scales" for additional options to show the level of alignment. Note that each course does not address all the program-level outcomes. This is typical of most programs.

Indicating Alignment and Mapping Scales:

In Figure 1, a basic scale is applied where x's are used to indicate whether alignment exists. It is important to note that when mapping alignment, you should consider the extent to which the course outcome associates with the program outcome. In this example, the x indicates moderate to strong alignment. If a course is only weakly or peripherally associated with a program outcome, alignment should either be omitted or should be noted that it is only weakly aligned.

Richer data can be achieved in mapping by using a scale that describes how alignment occurs between outcomes. A mapping scale can tell you more about the expectations in the course. This is useful information if you are interested, for example, in looking at the progression of skills or whether expectations are scaffolded throughout a program. When selecting a scale, make sure all mappers have the same understanding of what each level of the scale represents. Some examples (from Dyjur et al, 2019) include:

Introduced: Key ideas and concepts concentrate on knowledge or skills at a basic level. Instructional/learning activities address basic knowledge or skills at an entry- level complexity. **Developing:** Students demonstrate learning at an increasing level of proficiency. Instructional/learning activities concentrate on enhancing and strengthening existing knowledge and skills, as well as expanding complexity. **Advanced:** Students demonstrate the learning with an increasing level of independence, expertise and sophistication expected upon graduation. Instructional/learning activities focus on and integrate the use of content or skills in multiple levels of complexity.
Introduced: Concepts are introduced in the course but not assessed **Practiced:** Students practice their ability and understanding of the learning outcome **Demonstrated:** Students demonstrate their ability and understanding of the learning outcome
Confirmation: Student replicate results or learn technique using predetermined processes **Structured:** The question and methods are predetermined for students, who investigate for a solution **Guided:** Students select an inquiry question from a predetermined list. Students decide on the methods of analysis and conclusions. An answer has not been predetermined. **Open:** Students select the question to be investigated, and the method of analysis. The results have not been predetermined. *Note: this is an inquiry scale and is suitable when looking at a lab program, for example.*
Core: Fundamental learning is demonstrated at a moderate level of competence. Learners demonstrate strong knowledge and skills of foundational concepts and can apply them in a variety of contexts. **Advanced:** Learners demonstrate a high degree of knowledge and skill in a variety of foundational concepts. *Note: This is a two-step scale and is suitable for graduate-level programs*

Figure 2: Example of a curriculum map where the Introduced, Developing, and Advanced scale is applied. Program-level outcomes are listed down the first column and course-level outcomes for individual courses are listed along the top of the map. Alignment is only indicated when outcomes are moderately to strongly associated.

Program Map	SCI 1000		SCI 2000			SCI 2100		
	Outcome A	Outcome B	Outcome A	Outcome B	Outcome C	Outcome A	Outcome B	Outcome C
Program Outcome 1	I			D				
Program Outcome 2			I					
Program Outcome 3		I			D			A
Program Outcome 4						I		
Program Outcome 5				I			D	

References:

[1] P.J. Rayner, What is curriculum mapping and why do it?, Centre for Teaching, Learning and Technology, University of British Columbia, 2017.

[2] Dyjur, P., Grant, K., & Kalu, F. (2019). Curriculum review: Curriculum mapping. Taylor Institute for Teaching and Learning. Calgary: University of Calgary, CC BY-NC 4.0

[3] L. B. Buck, S. Lowery Bretz and M. H. Towns, Characterizing the level of inquiry in the undergraduate laboratory, Journal of College Science Teaching, 2008, 38, 52.