Curriculum Mapping

Introduction

Programme outcomes give a programme its goals and directions. In principle, the curriculum, pedagogy and assessment should all support the attainment of this set of outcomes in order to make the programme a truly outcome-*based* one. Curriculum mapping is a tool for checking the extent to which this is achieved.

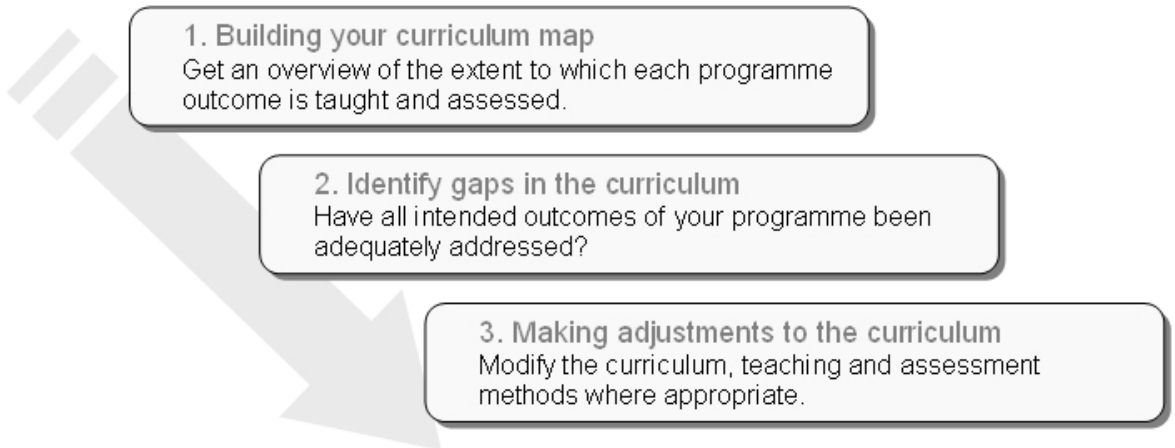
A curriculum mapping can be conceptualised as an analysis of the provision of opportunities for learning in a curriculum in relation to the curriculum's intended learning outcomes. By constructing a curriculum map, you will have an overview of how far and where in your programme each intended outcome is being addressed. You can then determine whether or not the learning opportunities provided are sufficient and in appropriate sequence so that adjustments can be made accordingly.

Before engaging into the process of curriculum mapping, you need to have these ready:

- ☐ Programme outcome statements
- ☐ Subject descriptions with outcome statements

The Process of Curriculum Mapping

Developing a successful outcome-based curriculum involves aligning teaching and assessment methods with the intended learning outcomes of the programme. Curriculum mapping provides a means to examine the extent to which these outcomes are being addressed and assessed in the curriculum. In this section, we shall go through the entire process of curriculum mapping, from the construction of the map to using the map to identify gaps in the curriculum, as well as how these gaps can be addressed. This process is summarised in the diagram below.



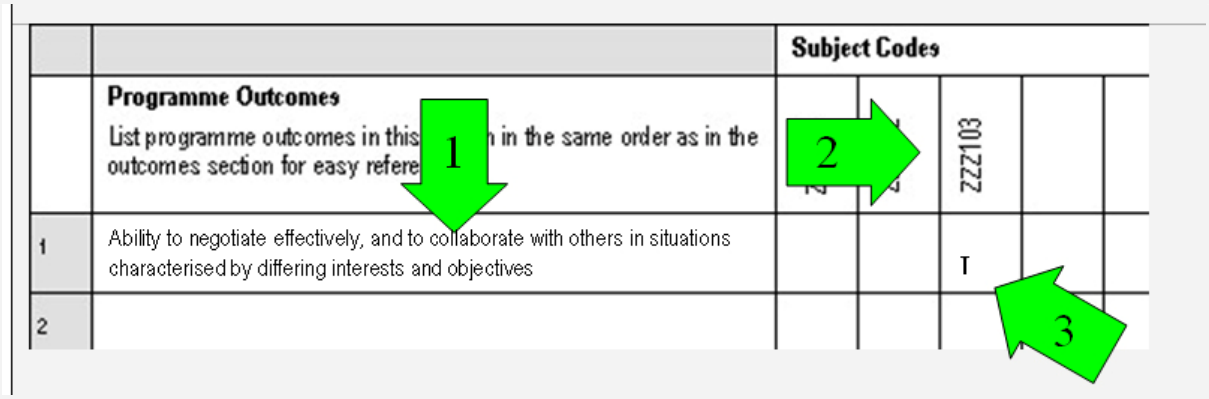
Building Your Curriculum Map

In the process of constructing the curriculum map, subject teachers will need to associate their subject outcomes with the programme outcomes. They must therefore understand the programme outcomes in

order to communicate and explain how their intended subject outcomes relate to the programme outcomes. There are many ways to build a curriculum map. In this part, we shall look at two examples.

Example 1

In this example, subjects are mapped to programme outcomes according to their subject outcome statement. This allows you to see how each subject contributes to the programme outcomes and where in the curriculum each outcome is being addressed. Given the appropriate use of indicators, this map can also give you some ideas about the extent of development of each outcome enabled by the curriculum. This kind of map is suitable for programmes where most intended learning is expected to occur within the formal curriculum.



Basic steps to build this curriculum map:

1. List programme outcomes in the left-column.
2. Label the adjacent columns with the subject codes of the constituent subjects of the programme.
3. Judging by the subject outcome statements, indicate in the appropriate cell the extent to which the programme outcome is being addressed in the subject by inserting suitable indicators (alternatively, subject teachers can supply information about or complete the relevant subject columns themselves).

Meaning of the indicators

I	(Introduced)	This subject offers learning opportunities for this particular intended outcome at an introductory level. On completion, students should have the foundational knowledge / skills / attributes to pursue this outcome further.
R	(Reinforced)	This subject will build upon student's existing knowledge / skills / attributes in this particular intended outcome to provide learning opportunities through which students can reinforce and/or further develop the knowledge / skills / attributes described in the outcome statement
A	(Assessed)	The attainment of this outcome will be assessed in this subject.

For a more elaborated map:

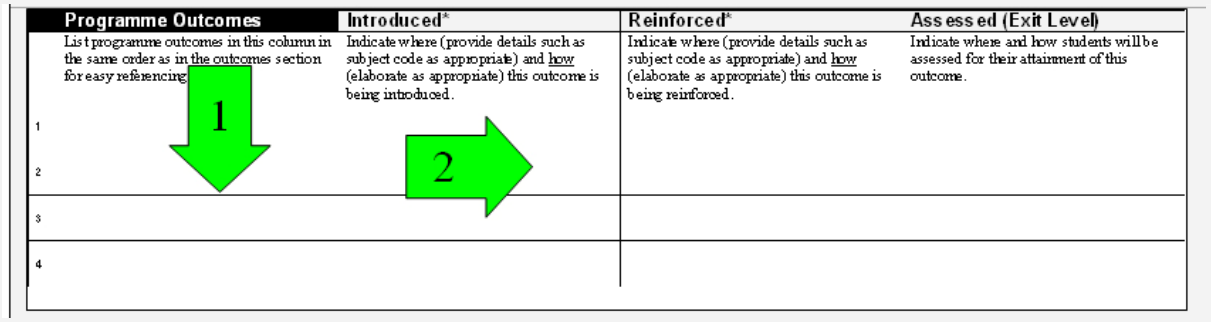
You may choose to include more information on your map, e.g. the teaching and assessment strategies employed in promoting the achievement of an outcome. Here is a simplified example of such a map:

	Subject A	**Subject B**	**Subject C**
Outcome #1	I: Lecture		RA: Case method
Outcome #2	IA: Project		
Outcome #3		IRA: work placement	

In this example, Outcome #1 is introduced through lecturing in Subject A and reinforced and assessed in Subject C using a case method. This gives you some basis to judge whether or not the learning opportunities provided for each outcome are appropriate and sufficient.

Example 2

This map puts more focus on how an outcome is being addressed (where it is introduced, reinforced or assessed). This design takes into account co-curricular and extra-curricular learning opportunities that are available to students, of which they are expected to participate in at least some. This style of mapping is suitable for programmes in which co-curricular and extra-curricular activities form an integral part of learning.



Basic steps to build this curriculum map:

1. List programme outcomes in the left-column.
2. Indicate in the adjacent columns the subjects and/or activities where elements of the outcomes are being introduced, reinforced, and assessed respectively.

Below is an example of a simplified map. From this map you can see that opportunities to reinforce the development of Outcome #2 can be found in Subject D and Subject G and it will be given an exit level assessment in Subject H, which is the final year project. You can also see that while Outcome #1 is introduced and reinforced, it is not currently being assessed at an exit level.

	Introduced	**Reinforced**	**Assessed (exit level)**
Outcome #1	Subject A (Lecture)	Subject C (Case-based learning) Subject F (PBL)	
Outcome #2	Subject B (Interactive lecture) Subject C (Self-directed learning)	Subject D (Laboratory) Subject G (Placement)	Subject H (Final year project)
Outcome #3		Subject E (Peer tutoring) Programme A (organised by SAO)	

Identifying Gaps in the Curriculum

Now you have your curriculum map ready. It gives you an overview of the distribution of resources and opportunities. As you can see from the above examples, each row of the map tells you about where and how a programme outcome is being addressed in the curriculum. Following are some prompt questions to help you see if there are any gaps in your curriculum.

Gap analysis

- ☐ Are all intended outcomes being adequately addressed? *See Case 1*
- ☐ Are there any outcomes addressed only in elective subjects that might, therefore, be neglected if the subjects were not chosen?
- ☐ Do the proposed pedagogy and assessment support such developments? *See Case 2*

☐ Does the curriculum provide multiple opportunities to develop each quality / ability / skill? ☐ Are the development opportunities of an outcome concentrated in only one or two subjects (as a result of which students would have little chance to apply and practise what they have learnt in those subjects)?	*See Case 3*
☐ Are some outcomes being under- or over-represented by your curriculum? ☐ Are the learning opportunities provided sufficient for the development of the intended outcomes?	*See Case 4*
This list of questions is not exhaustive. You may think of other things that are relevant to your curriculum design process and include them in this review process.	

It is important to share the results of the review among programme teachers for their comments and opinions on the appropriate actions to making the curriculum a better one. One should keep in mind that curriculum mapping is meant to be developmental and should be a collaborative effort of all teachers involved.

Making Adjustments to the Curriculum

Now that you have identified the gaps in your curriculum through the mapping exercise, you can make adjustments accordingly. Here are some common scenarios and what may be done to amend them.

Case 1: Problems with Addressing the Outcomes Adequately

There are times when the number of subjects contributing to a programme outcome is plenty, but the outcome is actually not being addressed adequately. This could happen when most of the relevant subject outcomes are written at a low level, requiring only skills like *describe*, *name*, *list*, *outline* etc. In such cases, try to re-orientate the subject learning to a higher level, demanding abilities like *analyse*, *evaluate*, *design*, *solve* etc. For example, instead of setting an outcome as ‘ability to name the parts of a machine’, make it ‘ability to analyse the structure of a machine’. This brings the subject outcomes closer to the functioning outcomes which the programme is trying to help students achieve. Of course, the teaching and assessment methods would need to be adjusted accordingly to support the new learning goals.

Case 2: Problems with Alignment

This issue arises when the kinds of teaching and assessment employed do not support the achievement of the intended learning outcomes (think about the example of teaching swimming by giving lectures). To amend this, consult “Aligning teaching with ILO” and “Aligning assessment with ILO” for details about choosing appropriate teaching and assessment methods.

Case 3: Regarding the Holistic Learning Experience

Most abilities develop over time. When the learning is concentrated within one or two subjects, the abilities developed tend to be out-of-context and short-lived because there is no chance to apply them elsewhere in the course. When the learning is widespread but unrelated, on the other hand, it becomes difficult for students to pull things together and integrate knowledge and skills learnt from different subjects to achieve the ultimate outcomes. In such cases, it is useful to look at the learning opportunities for an outcome as a total learning experience. Consider meaningfully combining and/or re-organising the relevant subjects as appropriate.

Case 4: Regarding Under- or Over-Represented Outcomes

Both under- and over-represented outcomes point to a mismatch between what is intended to be developed and what is being developed. A typical example is one in which students are given too many opportunities to 'get knowledge' but too little chance to learn to apply the knowledge and develop the skills that are relevant to their professions. To change this, the programme team would need to rethink about the curriculum in terms of the outcomes to be achieved and tailor a quality learning experience for it instead of struggling for a perfect content list. Consider using subject matter as a vehicle to develop discipline-specific as well as generic skills relevant to the profession. This approach is more preferable than cutting-and-adding subjects, because it not only restores the balance of the curriculum; it also tends to make the learning tasks more authentic.

While curriculum mapping reveals discrepancies between expectations and provision, one should also be beware of the possible discrepancies between the expectations of the programme and those of the discipline. Needless to say, the objectives and outcomes of a competent programme should always keep up with the changes in its discipline. Distribution of resources within the programme and the workload it imposes on both teachers and students are some other things to be considered when you refine your programme.

Managing the Mapping Process

Here are a few notes to ensure a smooth mapping process:

- **Communicate with the teachers** about the purposes and operation of the curriculum mapping exercise. Curriculum mapping is not the task of one or two individuals from the programme team, but a real team effort to understand the curriculum as it is and seek to improve it together.
- **Collaborative efforts** are particularly important when gaps are noticed and need rectifying.
- **From subject to programme,** start with subject teachers mapping their own subjects with the programme outcomes. Then put all the subject maps together to see the overall learning experiences provided by the programme as a whole.

Enhancing Teaching and Learning through Curriculum Mapping

Facilitate Constructive Alignment[1] in Curriculum Design

In the process of constructing the curriculum map, subject teachers will need to associate their subject outcomes with the programme outcomes. They must therefore understand the programme outcomes in order to communicate and explain how their intended subject outcomes relate to the programme outcomes. This helps to create a *shared vision* among the teachers involved of what the programme is trying to achieve. The communication generated in the mapping process can also facilitate better *collaboration* among teachers because, as you may have already found out, seldom is a programme outcome addressed only in one subject; usually a few subjects contribute to the attainment of the outcome. Teachers from those subjects, now having become aware of their common goal, can work together to design more fruitful learning experiences for their students as far as each particular outcome is concerned.

Some curriculum maps or mapping procedures also require teachers to indicate their intended teaching and assessment methods. This stimulates them to *reflect* on their teaching and assessment

[1] Constructive Alignment is a concept put forward by Professor John Biggs (1996). For more details, please refer to Section 1.3

methods in relation to their intended learning outcomes, thus constructive alignment in their curriculum design achieved.

While curriculum mapping is clearly useful in reviewing a curriculum, it also creates an opportunity to *review the objectives* of your programme. There are times when the curriculum evolves more quickly than the programme objectives (and thus intended outcomes). In such cases, the existing curriculum may be a better representation of a good programme than the existing list of outcome statements. The point is that curriculum mapping is just a means to facilitate constructive alignment in curriculum design; it is not the end of, or any definitive criterion for, the curriculum development exercise. One should beware not to engage in the mapping process alone and forget about the actual purpose of reviewing the curriculum.

Help Students Manage Their Own Learning

Curriculum mapping is not really a painless task. The good news is that the product – the curriculum map – is not only useful to the programme team, but also to all students taking or thinking about taking the programme. One major de-motivator in learning is the confusion in learning objectives. A curriculum map clarifies learning goals for students and gives them a holistic picture of the programme. It also enables students to learn about the opportunities available in the programme through which they can develop academically, professionally and personally, so that they can manage their learning better.