

Designing Learner-Centric MOOCs

**Prof.Sridhar Iyer
Prof.Sahana Murthy
Dr.Jayakrishnan M
Dr.Sameer Sahasrabudhe**

Indian Institute of Technology, IITB

Lecture 17

Creating LbDs

Learning by Doing is a formative assessment activity. What this means is that learners get sufficient and multiple opportunities to practice, to apply, and get feedback on their work. If we look at the structure of an LbD, the learners first do an activity such as solve a problem or click on the choice to the answer of a question and then they get feedback.

This feedback is formative. That means it helps the learner take stock of where their work is at the current point and helps them improve and revise their work so that they get closer to the learning goal. LbD activities help learners towards the goals of concept attainment or immediate application of some content or integration of knowledge.

When should an instructor design LbD activities? This depends on the goal. For the goals of concept attainment or immediate application and practice, a guideline is to provide one or more LbDs for every learning dialogue. These activities can be at recall level or they can be simple numerical problem-solving. In course design terminology, these activities can address unit-level learning outcomes. Since every LeD is followed by one or more LbDs, the implication is to provide multiple LbDs in a module and intersperse them throughout the module.

For the goal of integration of knowledge the guideline is to assign a synthesized Learning by Doing activity after a series of Learning Dialogues and their associated smaller LbDs. These activities may require the learner to apply concepts from

multiple LeDs and their corresponding smaller LbDs. These activities can be at higher cognitive levels and address the broader course-level learning outcomes.

What are the types of LbD activities? Let's examine this first from a pedagogical perspective. An instructor might want their learners to reason conceptually or to predict the outcome of an experiment or demo or to reason with representations. For example, translate between graphs and diagrams and text and so on.

Another type of pedagogical goal an instructor might be interested in is to get learners to match or pair definitions and terminology and of course, there's problem-solving, either short numerical problems or longer problems requiring a process, maybe a scenario-based question, may be an essay type question and so on. We can examine the different types of Learning by Doing activities from the perspective of what formats are available on the MOOC platform.

At this point, let us pause and do a reflection spot activity. You may have taken a MOOC as a learner or you may have even offered a MOOC in your subject as a teacher on some MOOC platform. Think of these MOOC platforms, and list two things. Firstly list two commonly available formats of activities or questions that you may have encountered on these platforms. And second, list two formats of questions that you found interesting or unusual or something different. Pause the slide for now and when you are done listing, please resume.

Commonly available formats of questions include multiple choice questions, which may be the most common type of questions or activity that one encounters in a MOOC platform. Multiple choice questions can have a single correct answer or it can include checkboxes which means a multiple selection of checkboxes may be valid.

Another common format of a question or an activity is where a text box is provided. Either for a short text input or a numerical input or may be even for a longer essay length, longer text input. Dropdowns are also available when there are questions which have a specified number of choices. If we look at more advanced type of activities, one encounters questions such as drag and drop

activity. So here what a learner can do is drag and drop text onto images, or images onto images, or text into some blank slots and so on.

Other types of formats include questions where math expressions can be the answer or a part of a program or code can directly be input into the text box and it's directly graded. Some questions also can be very specific to certain domain. For example, there are some questions called circuit builder questions, where the learner can actually draw circuit and that is the format which is required or in Chemistry, molecular structures can be input directly as the answer to the questions.

Now in all these questions often there is provision for hints to be provided. On the NPTEL platform, you would encounter multiple choice questions or MCQs with single correct answer or multiple choice questions where more than one answer can be selected MSQs. You will also encounter text box types of questions which are called short answer questions or numerical text input questions and you may also see hints in these questions.

The pedagogical perspective and the formats available on the platform also map to each other. For example, multiple choice questions can be used for conceptual reasoning, for prediction of an outcome or for reasoning with representations. Numerical input problems can be used to solve a problem and give a short answer and a textbox can be used for a scenario based question.

To summarize, while creating an LbD activity, we need to start with the learning goal, "is it concept attainment, application, integration of knowledge". We can use our teaching experience to decide the pedagogical goal and the pedagogical type and we need to explore the platform to decide the format of the question and then combine all this using our creativity.

Now that you've written an LbD activity thought about its format and maybe even explored the technology options and created the activity. Are we done? If we look at it from the learners perspective let's see what has happened so far. The learners see the question, answers it, maybe clicks on that choice maybe rights there answers, and submit it. Then they expect something in return. They expect

feedback on the work, whether it was correct or not, and if it was wrong they may even expect what to do next.

Also let's recall that LbD activities are formative assessment activities. The loop of formative assessment is closed when the learner gets feedback on their current work and also pointers on what they should do next. In the next learning dialogue we will explore how to give effective feedback of this kind.