Designing learner-centric e-learning in STEM disciplines
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Lecture – 04
E-Learning in STEM: Overview

E-learning is ubiquitous today. We hearing the news that the advent of information and communication technologies has brought a revolution in teaching and learning. We see E-learning in schools and colleges, in MOOCs and corporate training sessions, in large scale government projects and many other places.

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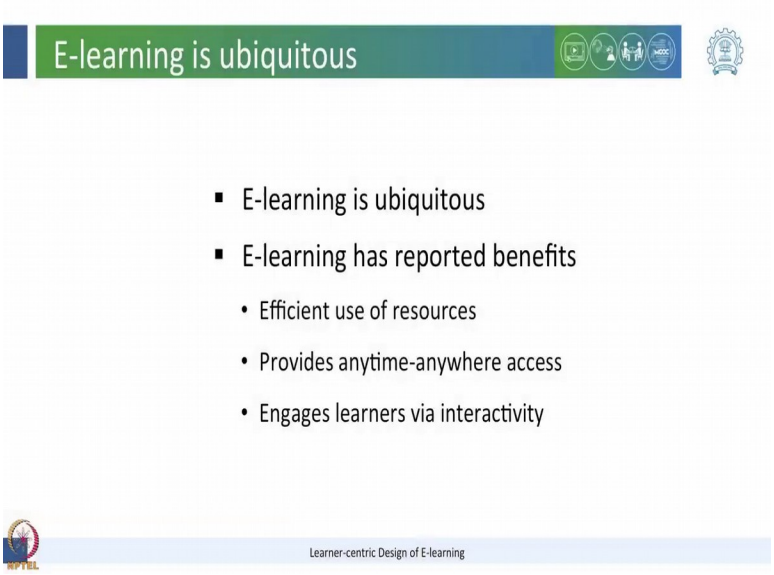

We here reported benefits of e-learning some of it is about saving time and money and resources, but going beyond this efficiency metric E-learning is also said to provide anytime anywhere access in systems that are easy to navigate by students. E-learning is said to engage learners via interactive tools and we hear many other such reported benefits.

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Let us now pause at a reflection spot. What comes to your mind when you hear e learning? Pause this learning dialogue write your response and when you are done please resume.

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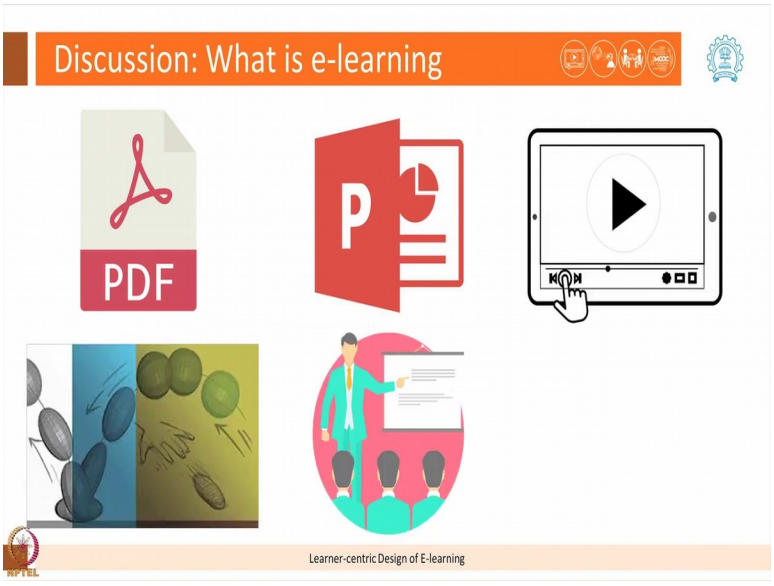

Some of you may have written digitized text such as PDFs or PowerPoint slides with images, others may have thought of videos animations presentations and simulations.

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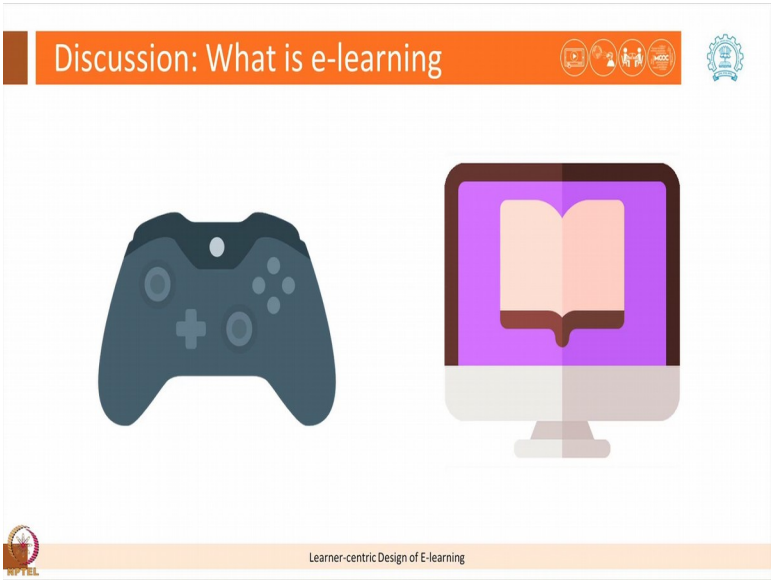

Perhaps you may have encountered games, E books and many more such examples.

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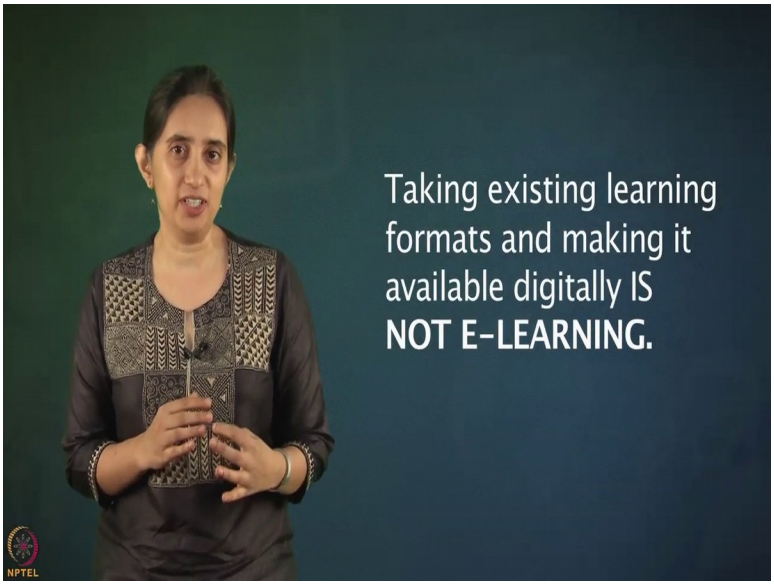

Before we continue any further, let us see what is not E-learning? Merely taking existing learning formats such as information in textbooks and make them available digitally is not E-learning. Let us reflect upon this point a little further for each reflection spot pause choose your answer then resume the learning dialogue.

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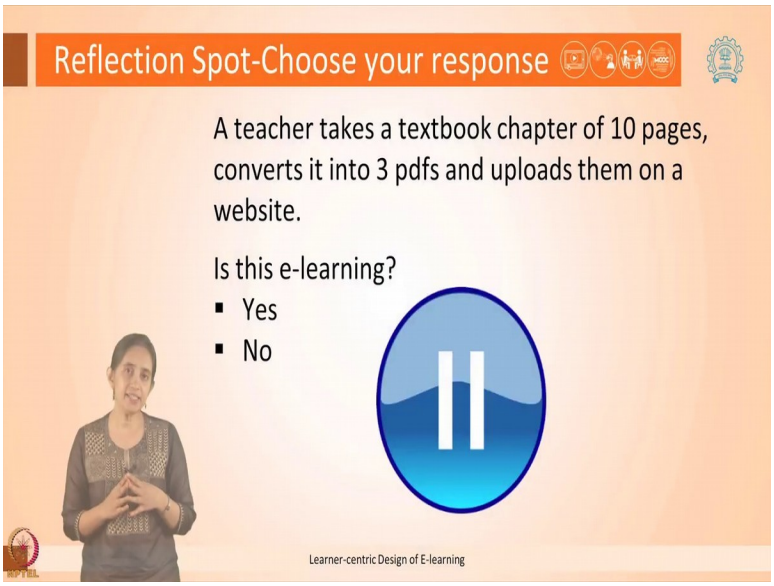

A teacher takes a textbook of 10 pages converts them to PDF and uploads three PDFs on the web is this e-learning; pause choose yes or no and then presume.

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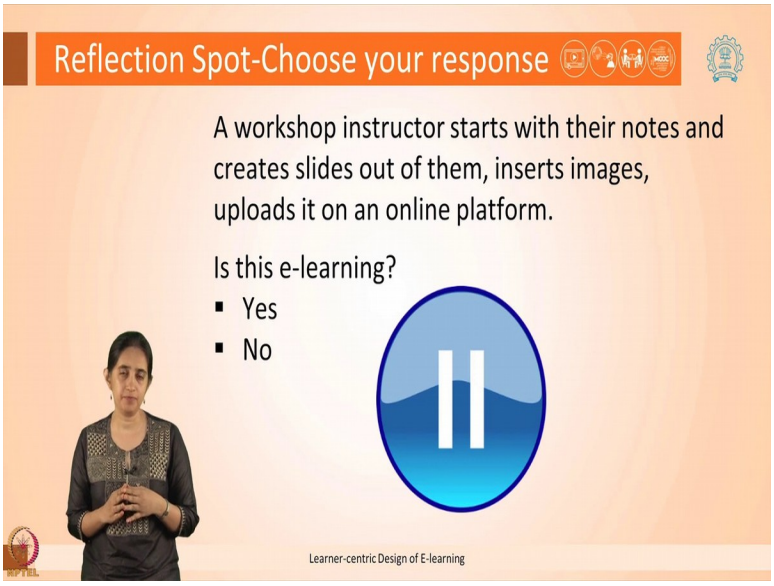

Let us see one more example. A workshop instructor starts with their notes creates PowerPoint slides out of them includes images and puts it up on some online platform is this e-learning?

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Let us see yet another example. An instructor creates a video of her lecture class and uploads it on to their college learning management system is this e-learning?

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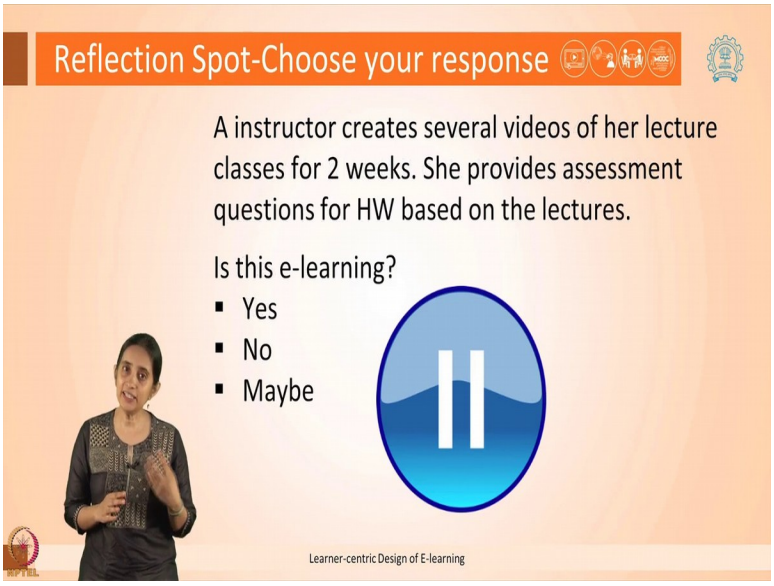

Continuing on the previous example, an instructor creates videos of her lecture class for 2 weeks perhaps 4 5 or 6 lectures. She then provides assessment questions similar to homework based on these 5 lectures is this e-learning?

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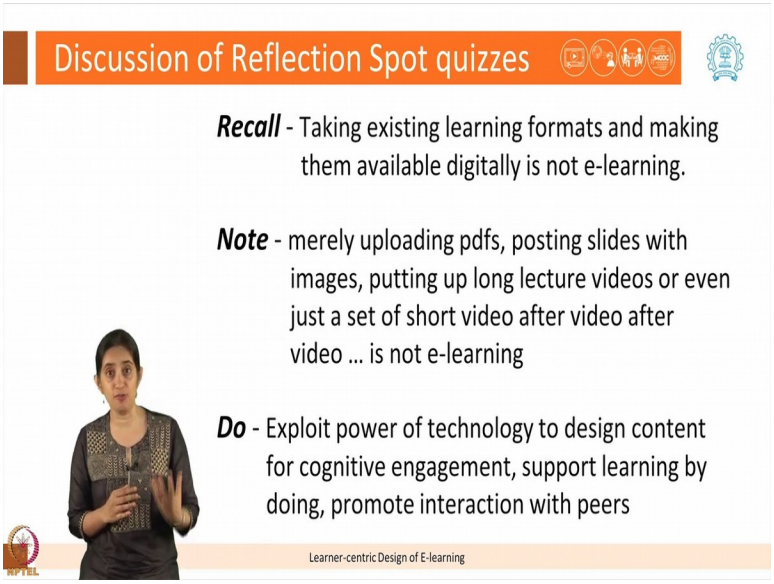

Let us discuss whether these examples are indeed e-learning. Recall that merely taking existing learning formats and making that information available digitally is not e-learning. So, a set of PDFs or PowerPoint slides with images uploaded somewhere is not e-learning, where is the learning in that? Going further, a set of videos plus some assessment questions like in the last example seems like its doing better, but is that enough? Will that ensure that learning actually happens where this e-learning? If we are using the ICT only as a medium to make information available and for content delivery then that is not enough.

If on the other hand we are exploiting the power of technology, we are using its affordances and designing content and the learning environment such that learners are engaged with the content, such that they are figuring things out making meaning perhaps interacting with each other they are motivated to learn, then we are doing our job as designers of e-learning.

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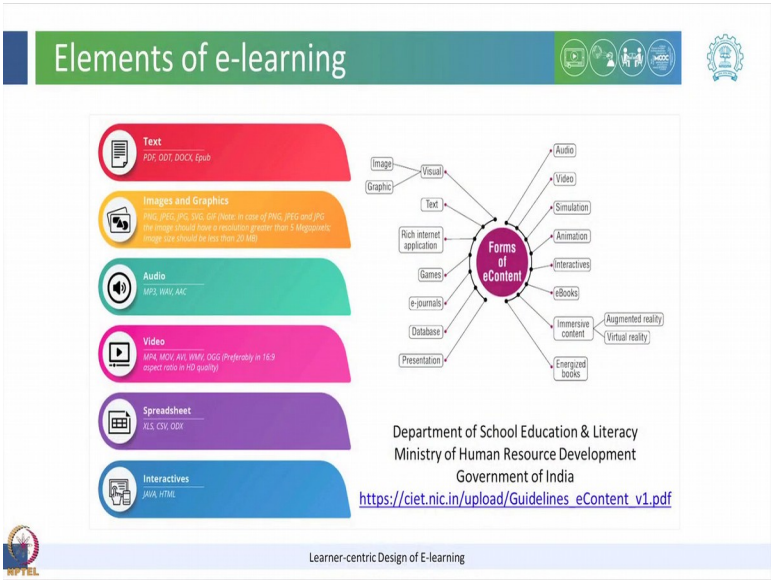

So, the examples we saw in the reflection spots may be included as elements or aspects of e - learning, but they alone may not be enough. Let us now see some examples where technology affordances indeed have been utilized to address learning and engagement.

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Here is an example of a video teaching children about saturated solutions by engaging them with real life examples. There are meaningful visuals in the video, there is a dialogue between two

children. So, it is interactive and even further children identify because its other characters like them who are interacting with each other and with the content. What are we going to do today?

I want to test whether a glass of water can resolve any amount of sugar what is there to check.

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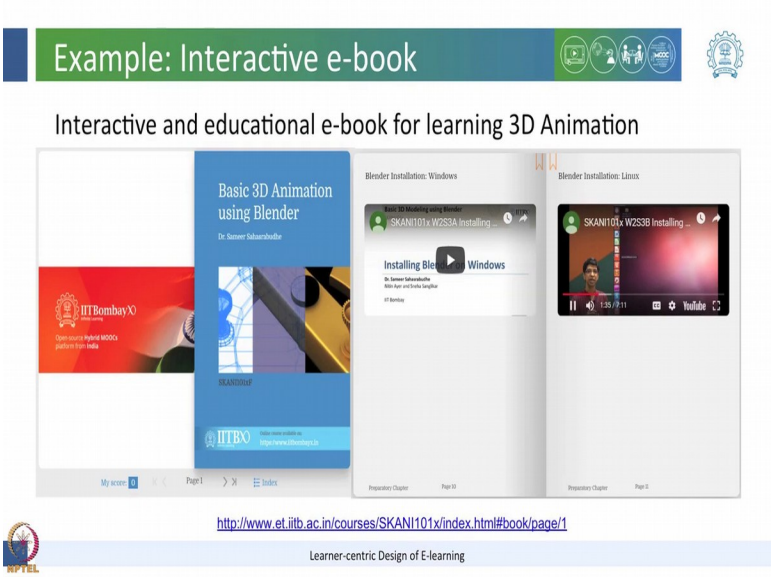

The next example is that of an interactive e book for learning blender 3D animations for animators and other working professionals. See in this example that immediately after learning a concept or technique through the video within the e book, the learner is asked to check his or her understanding and apply it.

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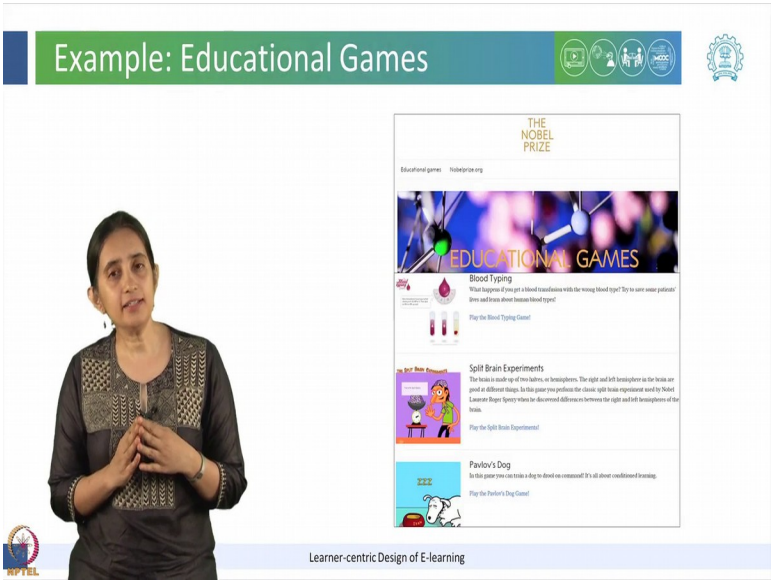

Another example is that of educational games which again many of you may have heard off.

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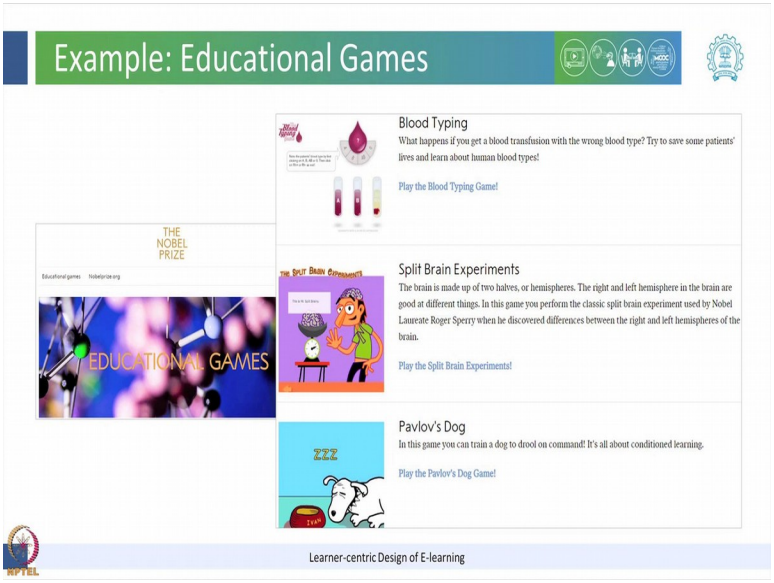

The example shown is that of animated and interactive educational games based on the work of Nobel Prize winners. So, this is cutting edge science which is being learned along with an element of fun and competitiveness.

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Another example of an educational game is situational games, where learners have to solve a relevant problem by interacting with various characters or various parts of the game and simulate real world scenarios and see the results.

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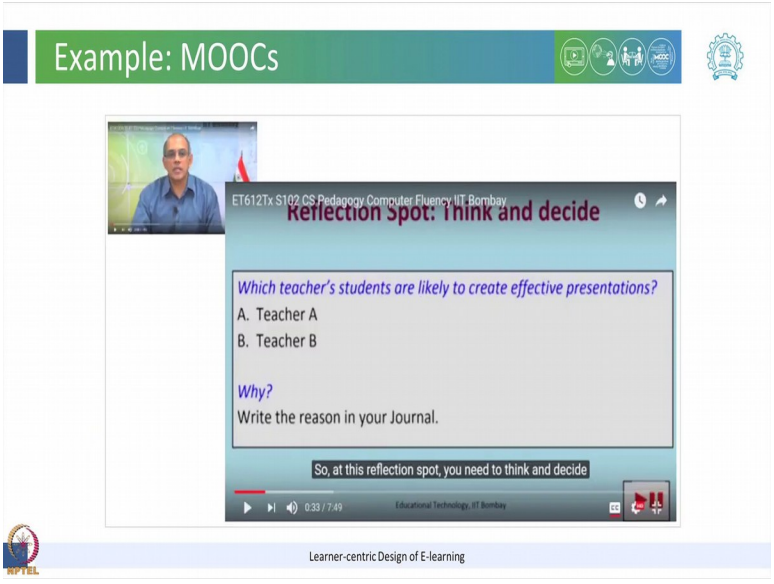

A popular example of e-learning is an online course such as a MOOC. A MOOC again is not merely a collection of lecture videos uploaded on a platform.

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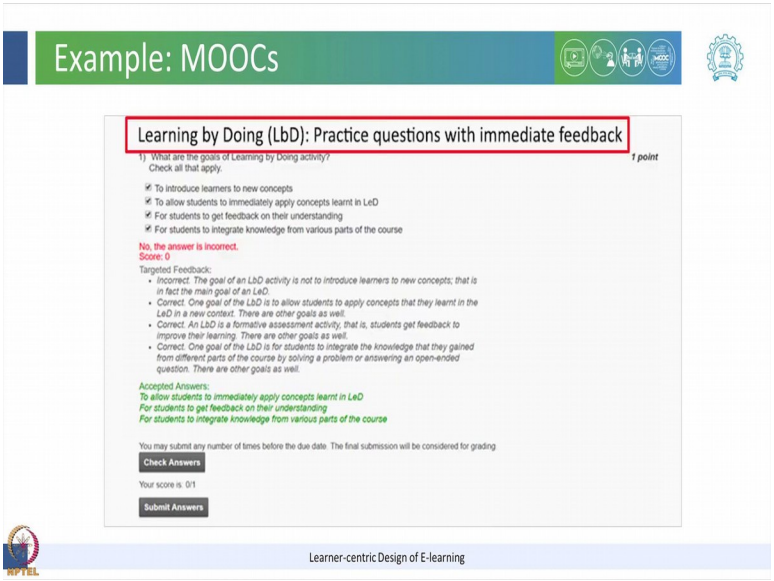

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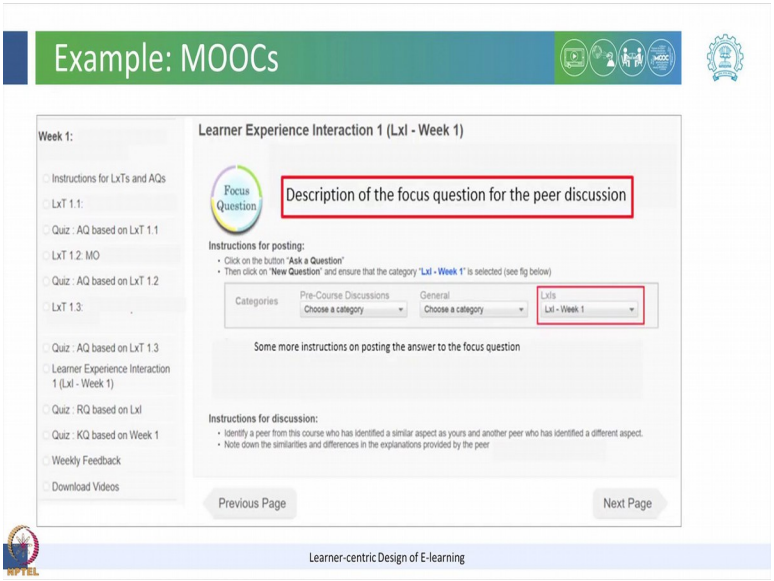

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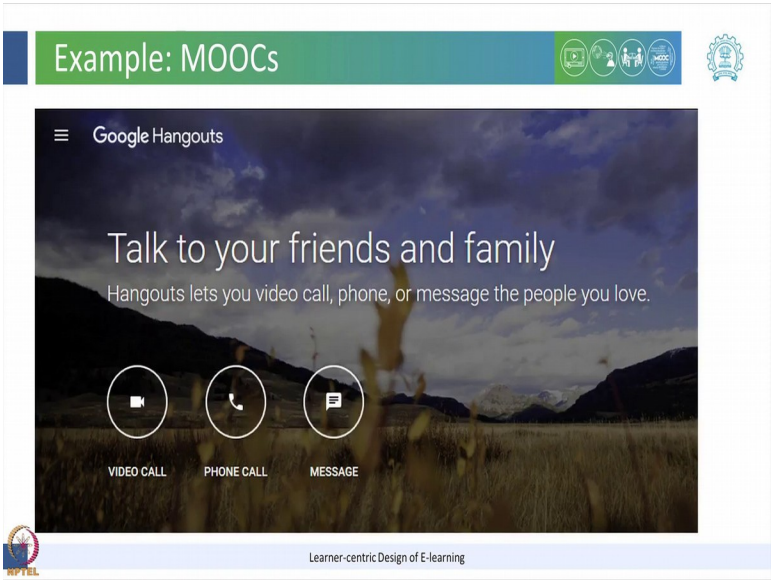

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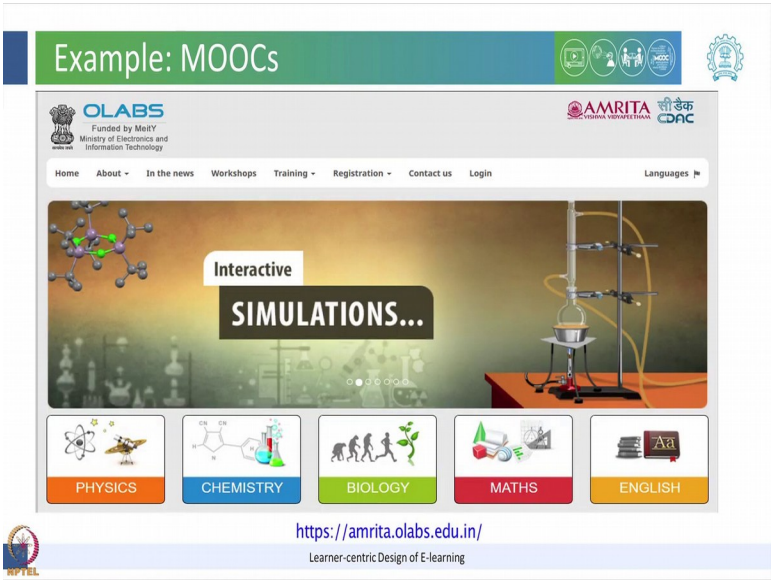

But a MOOC contains videos with in video embedded activities questions followed by immediate feedback, discussion forums and peer review, interactive sessions such as on hangouts, virtual labs, personalized communication with learners and several other such elements. In this course we will focus on e-learning in stem disciplines science technology engineering and mathematics; e-learning has been reported to be a systematic and effective

intervention to support enhancement of teaching and learning in stem. While the concepts and principles that we discuss in this course may be applicable to other topics and other contexts our examples will be from stem disciplines.

To summarize the key takeaway of this learning dialogue is what is not e-learning. We did see some examples of e-learning where the technology affordances were utilized to address some aspect of what learners need such as engagement or interactivity or meaningful learning. In the next learning dialogue we will look at some challenges of e-learning especially those that arise due to the format and the medium itself.

Thank you.