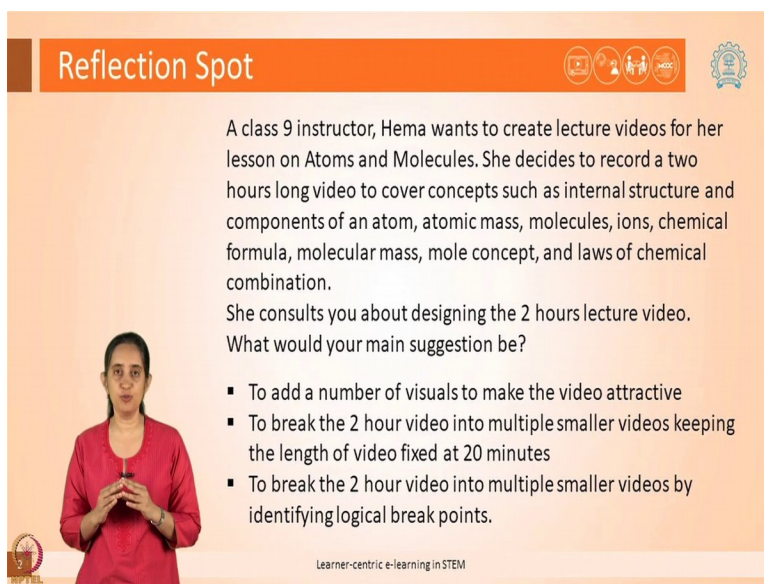


Designing learner-centric e-learning in STEM disciplines
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Indian Institute of Technology, Bombay

Lecture - 11
Promoting learner engagement with content

In this learning dialogue let us look at the principles and strategies available to us to engage learners in the content in the form of a video.

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Reflection Spot

A class 9 instructor, Hema wants to create lecture videos for her lesson on Atoms and Molecules. She decides to record a two hours long video to cover concepts such as internal structure and components of an atom, atomic mass, molecules, ions, chemical formula, molecular mass, mole concept, and laws of chemical combination.

She consults you about designing the 2 hours lecture video. What would your main suggestion be?

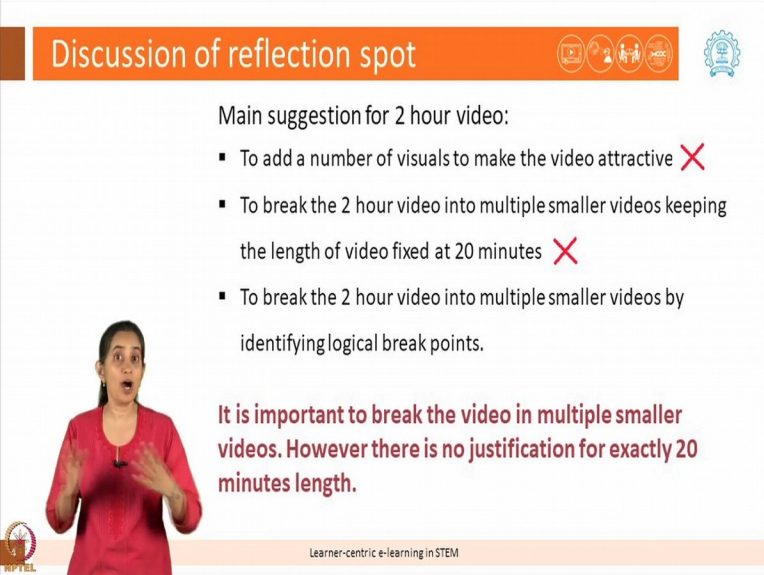
- To add a number of visuals to make the video attractive
- To break the 2 hour video into multiple smaller videos keeping the length of video fixed at 20 minutes
- To break the 2 hour video into multiple smaller videos by identifying logical break points.

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Let us begin with a reflection spot. A class 9 instructor, Hema wants to create content videos for her lesson on atoms and molecules in a chemistry course. She decides to record a two hour long video to cover concepts like atoms ions molecules atomic mass and many other topics and subtopics which are required for that content. She consults you about designing the 2 hour long video.

What will your main suggestion be? Choose the best answer among the choices given and then resume the learning dialogue. Let us discuss the various options provided as to what suggestions someone could have given Hema.

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Discussion of reflection spot

Main suggestion for 2 hour video:

- To add a number of visuals to make the video attractive ✗
- To break the 2 hour video into multiple smaller videos keeping the length of video fixed at 20 minutes ✗
- To break the 2 hour video into multiple smaller videos by identifying logical break points.

It is important to break the video in multiple smaller videos. However there is no justification for exactly 20 minutes length.

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The first suggestion first possible suggestion was to include visuals to make the video attractive. Well, this may be important and it may improve engagement or something at some point it is not the first design decision that you will take. Also if you are thinking about visuals they need to be pedagogically meaningful and not included just for attractiveness. The other options were related to the length of the video, it is very important to break the video into multiple smaller videos 2 hours is just too long.

However, for keeping the video length at a fixed length in the option it said 20 minutes there is no real justification that a video must exactly be of 10 minutes or 12 minutes or 20 minutes or 3 minutes; there is no guiding principle that tells us that.

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Discussion of reflection spot

Main suggestion for 2 hour video:

- To add a number of visuals to make the video attractive ✗
- To break the 2 hour video into multiple smaller videos keeping the length of video fixed at 20 minutes ✗
- To break the 2 hour video into multiple smaller videos by identifying logical break points. ✓

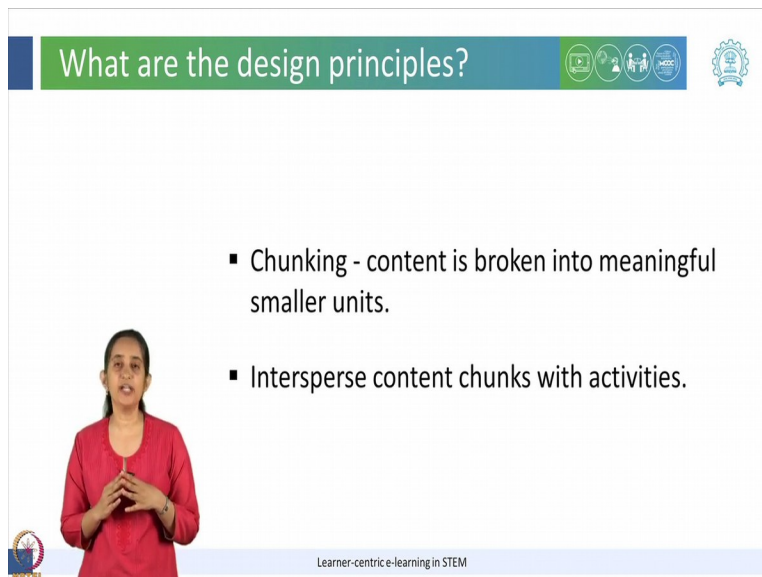
Break the 2 hour video into multiple smaller videos by identifying logical break points.

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The key point in breaking up a longer video into multiple smaller videos is to identify logical break points and then decide how to chunk the videos.

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What are the design principles?

- Chunking - content is broken into meaningful smaller units.
- Intersperse content chunks with activities.

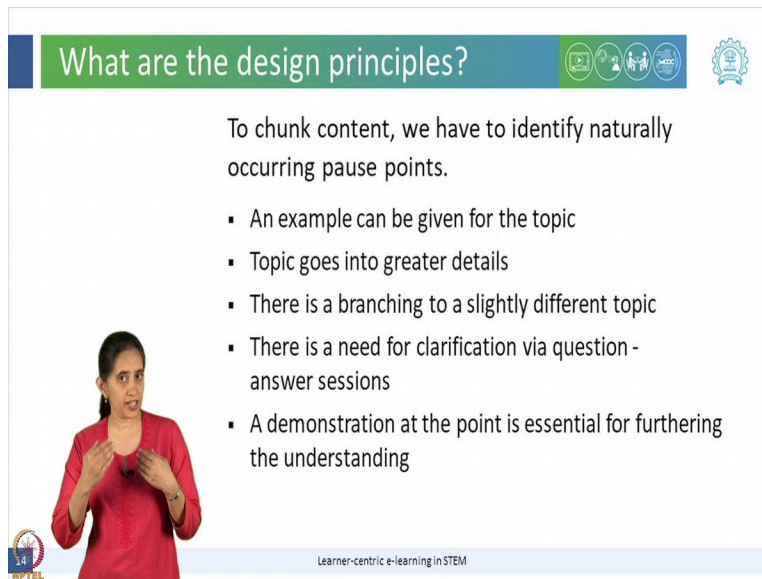
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So, the main design principle here is called chunking and what chunking means is that certain content needs to be broken up into meaningful smaller units. So, that is all behind chunking, but

the 2 key words here were the 3 key words: one is broken up one is smaller units and the main thing that we have to pay attention to is meaningful.

So, how do we break a longer piece of content? How do we go about deciding to identify smaller pieces of it, meaningful smaller pieces? So, one way to do it is to think of naturally occurring pause points.

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The slide features a green header with the title "What are the design principles?". To the right of the title are four circular icons representing different design principles. Below the title, the text "To chunk content, we have to identify naturally occurring pause points." is displayed. A bulleted list follows, detailing five principles. On the left side of the slide, a woman in a red top is shown from the waist up, gesturing with her hands. At the bottom left is the NPTEL logo, and at the bottom center is the text "Learner-centric e-learning in STEM".

What are the design principles?

To chunk content, we have to identify naturally occurring pause points.

- An example can be given for the topic
- Topic goes into greater details
- There is a branching to a slightly different topic
- There is a need for clarification via question - answer sessions
- A demonstration at the point is essential for furthering the understanding

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And as an instructor we know where these pause points are for example, after explaining a small concept for example, we want to give an example that could be a pause point. Another pause point could be when a particular topic needs to be delved into further details or when a slight digression needs to be made from a main topic into a slightly different topic; sometimes there is a need to clarify a particular point a difficult point perhaps in a classroom you would know this because there will be a question at that point, sometimes a demonstration may be required to clarify a certain concept more. So, these are all points where it is natural to take a breath really it is natural to pause and these can be identified to create meaningful chunks.

So, when you are creating a short video first do this chunking with the content and this can be done on paper before you go ahead and record a before anything is done with the technology and then decide whether one chunk or two chunks should be included into one video. In this course you would have seen that we have several learning dialogues even in one topic and you can start

noticing this now that each learning dialogue deals with one or maybe two chunks at a time. In addition to chunking another key design principle is to intersperse chunks with activities.

Now, that we saw the key design principles of chunking and interspersing the chunk with activities, let us look at some strategies to incorporate these design principles so, that we address learner engagement with the content.

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The slide is titled "Strategies for ensuring learner engagement with content" in a green header bar. Below the title, on the left, is a woman in a red top with her hands clasped. To her right is a large icon of a video player with a play button. Below the video player icon, the text "Make short videos after identifying logical breakpoints" is written in red. At the bottom left is the NPTEL logo, and at the bottom right is the text "Learner-centric e-learning in STEM".

The first one of course, was to make videos short and we can put this short in quotes because it is really up to the instructor and instructional designer to decide how short they are, but the way to do it is to identify the logical pause points and the chunks.

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Strategies for ensuring learner engagement with content



Annotate videos at key points so that a jump between sections of the video is possible.

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Another strategy is to annotate videos at key points so, that a learner can jump back and forth within the video within these subtopics of the video. To enable navigation the click backward and click forward pauses can be included.

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Strategies for ensuring learner engagement with content



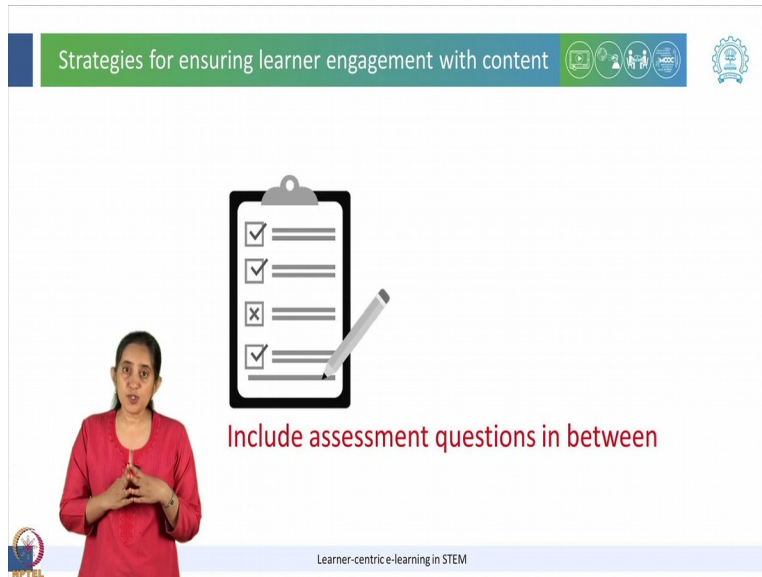
Interperse activities within and between videos

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Another strategy is to intersperse small activities between the chunk where the logical pause point is. A good example of this is the reflection spot that we use in this very course.

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Strategies for ensuring learner engagement with content

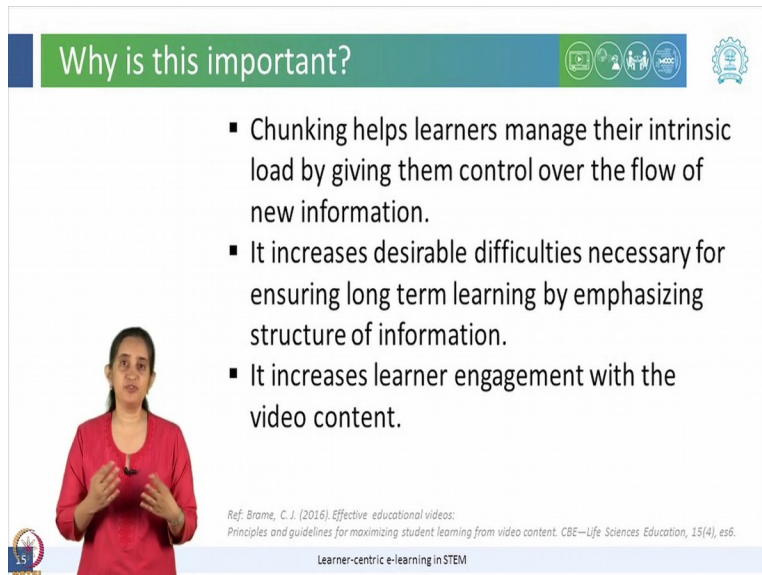
Include assessment questions in between

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The slide features a presenter on the left and a large checklist icon on the right. The checklist has four items, with the first, second, and fourth items marked with checkmarks and the third item marked with an 'X'. A pencil is shown writing on the bottom of the checklist.

We can also include short assessment questions, formative assessment questions in between the chunks where a learner can click a multiple choice question just like you did at the beginning of this learning dialogue.

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Why is this important?

- Chunking helps learners manage their intrinsic load by giving them control over the flow of new information.
- It increases desirable difficulties necessary for ensuring long term learning by emphasizing structure of information.
- It increases learner engagement with the video content.

Ref: Brame, C. J. (2016). Effective educational videos: Principles and guidelines for maximizing student learning from video content. CBE—Life Sciences Education, 15(4), es6.

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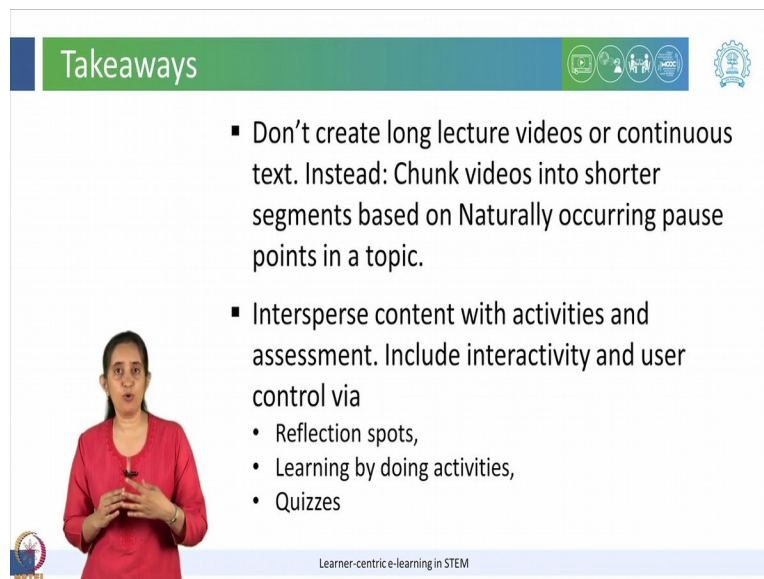
The slide features a presenter on the left and a list of three bullet points on the right. The text is in a clean, sans-serif font.

So, why are these design principles and strategies important? Chunking helps learners manage their intrinsic cognitive load. So, it avoids overloading working memory and learners are able to

pay attention only to small chunks at a time and this gives them control over the flow of new information it also helps them focus attention on the key points.

So, even some amount of challenge some amount of difficulty could be desirable here. So, long as learners attention is focused on the particular chunk and that particular content which is being discussed at that time. It helps to emphasize the structure of the information. These strategies which affect the working memory and learner attention can lead to improved learner engagement with the content.

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Takeaways

- Don't create long lecture videos or continuous text. Instead: Chunk videos into shorter segments based on Naturally occurring pause points in a topic.
- Intersperse content with activities and assessment. Include interactivity and user control via
 - Reflection spots,
 - Learning by doing activities,
 - Quizzes

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What are the takeaways for us as designers of learner centric e-content? One do not create long lecture videos instead chunk videos into shorter meaningful units based on naturally occurring pause points. And two intersperse content with activities and assessment include interactivity, include learner control by strategies such as reflection spots, learning by doing activities and formative assessment in between the video.

In the next few learning dialogues we will look at a few other strategies for engaging learners with the content; some of them address in video content activities within a video and some are how to engage learners in the content by creating activities in between videos.

Thank you.