

Design and technological aspects of e-Learning multimedia content

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Focus of this talk

Is on:

- Content creation methodologies for elearning.
- Technologies and tools – Flash, Java, Blender etc.

Not on:

- Delivery mechanisms – Internet, Offline etc.
- Multimedia querying and other aspects.

What is different in e-learning?

- Luxury of face-to-face communication may not be available.
- Multimedia content has to be meaningful and useful even in stand-alone mode.
- Interactivity plays an important role.
 - Why is interactivity important?
 - How to include interactivity in various modes of e-learning?

Forms of e-learning content

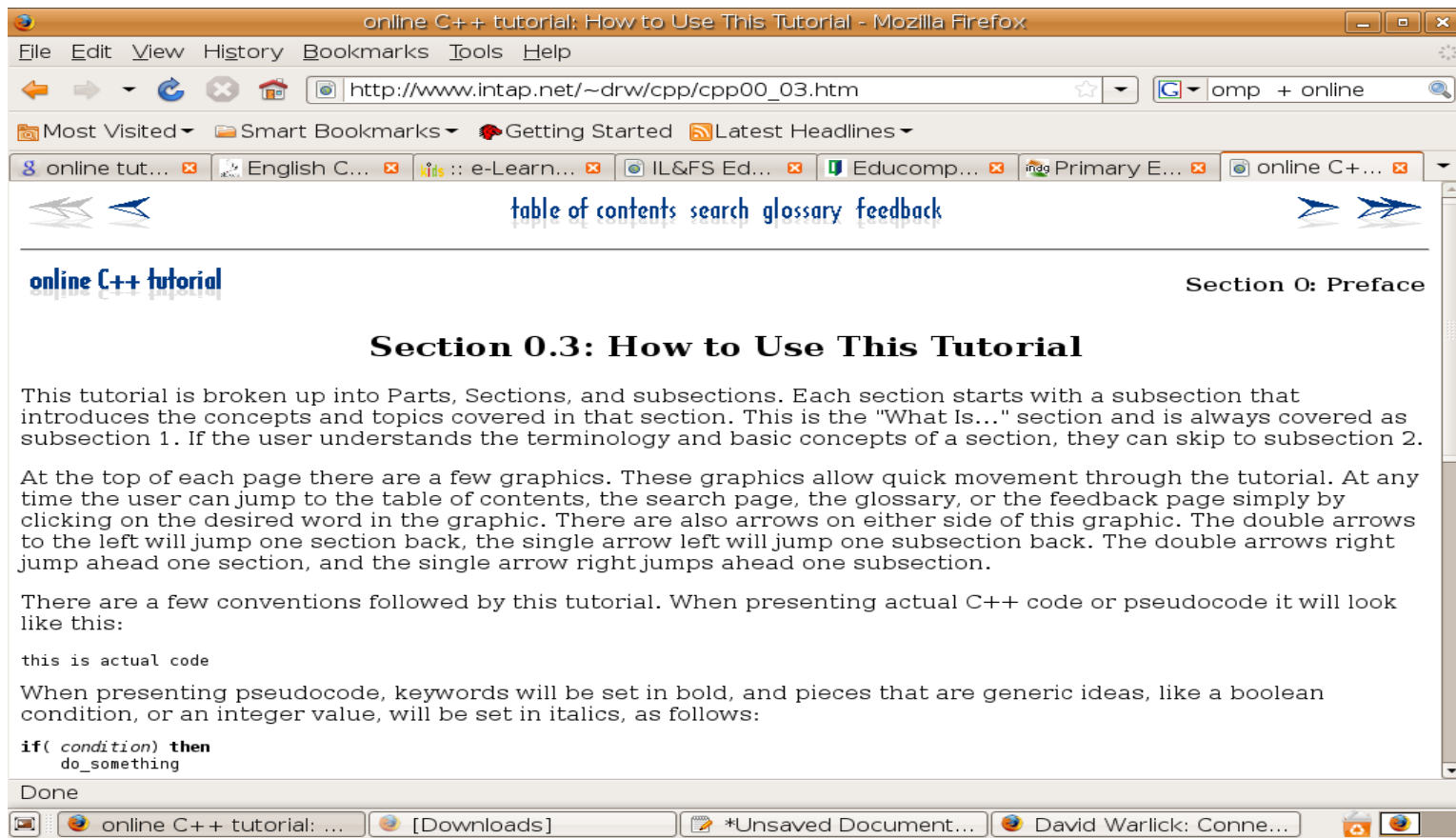
- PPT
- PDF / HTML
- Animations
- Videos
- Simulations
- Mobiles
- Any other?

Some questions

- How to get students to use e-learning?
 - They are the final consumers of the content!
 - Students naturally have a positive attitude towards new media and technology.
 - We need to adapt the content to their requirements – flexibility (anytime-anywhere-anydevice), interactivity, modularity, short attention span, ...
- Quality of content is the deciding factor.

When is e-learning not meaningful? -1

- It consists of text pages with next buttons.
 - Might as well print it and read the book.



online C++ tutorial: How to Use This Tutorial - Mozilla Firefox

File Edit View History Bookmarks Tools Help

http://www.intap.net/~drw/cpp/cpp00_03.htm

Most Visited Smart Bookmarks Getting Started Latest Headlines

online tut... English C... e-Learn... IL&FS Ed... Educomp... Primary E... online C+...

table of contents search glossary feedback

online C++ tutorial Section 0: Preface

Section 0.3: How to Use This Tutorial

This tutorial is broken up into Parts, Sections, and subsections. Each section starts with a subsection that introduces the concepts and topics covered in that section. This is the "What Is..." section and is always covered as subsection 1. If the user understands the terminology and basic concepts of a section, they can skip to subsection 2.

At the top of each page there are a few graphics. These graphics allow quick movement through the tutorial. At any time the user can jump to the table of contents, the search page, the glossary, or the feedback page simply by clicking on the desired word in the graphic. There are also arrows on either side of this graphic. The double arrows to the left will jump one section back, the single arrow left will jump one subsection back. The double arrows right jump ahead one section, and the single arrow right jumps ahead one subsection.

There are a few conventions followed by this tutorial. When presenting actual C++ code or pseudocode it will look like this:

```
this is actual code
```

When presenting pseudocode, keywords will be set in bold, and pieces that are generic ideas, like a boolean condition, or an integer value, will be set in italics, as follows:

```
if( condition ) then  
    do_something
```

Done

online C++ tutorial: ... [Downloads] *Unsaved Document... David Warlick: Conne...

When is e-learning not meaningful? -2

- It has more frills than substance.
 - Distracts the user.

Learn
Physics
using Java

C.K. Ng's website

Mechanics
Light & Wave
Electromagnetism
Electronics
Chinese Version

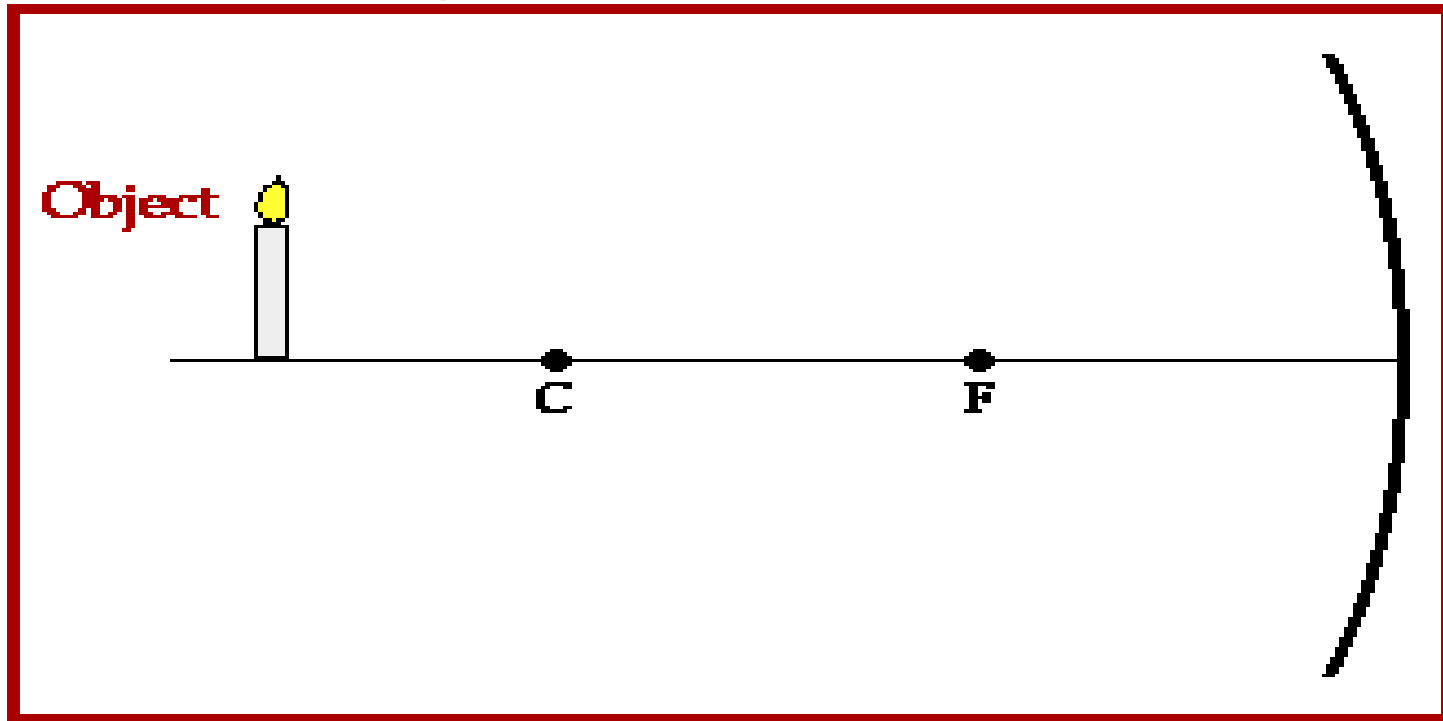
Isaac Newton
1642-1727

Newton's first law of motion:
Every body continues to be in a state of rest or
move with uniform velocity unless a resultant
force acts on it.
All matter resists any change in its motion.
This property is called INERTIA.

Replay

When is e-learning not meaningful? -3

- Interactivity is low.
 - Difficult to keep reader interest without this.



What usually goes wrong?

Content creators focus on effort minimization.

- Teachers convert their classroom teaching into audio lectures or video lectures.
- Add some slides and in some cases animations.

Why?

- Overworked, underpaid teachers.
- Forget to keep in mind that the learner is remote.

Effect of under-designing poor design principles => ineffective appeal

Vertical Projectile Motion 1 - Throw a hammer in the air!

[Wait until the applet loads completely {you will see a message down in the status bar saying it is "running"} before pressing PLAY.]

Description : We throw a hammer in the air .. where it lands .. well, let's put it this way - wear a hardhat! [Use the head of the hammer as the point for measurements. Also note that the "origin" is shifted upward in each figure so the head of the hammer starts at the origin.]

Questions

- A) What is the highest point in the flight of the Hammer?
- B) What is the initial speed of the Hammer?
- C) How long does the Hammer take to reach the very top? D) If you doubled the initial speed, how high would the hammer go?

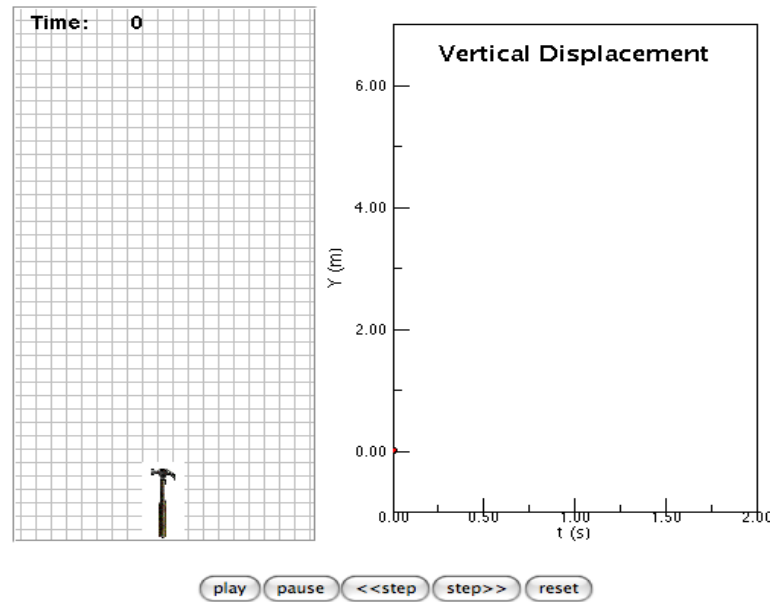
[Try double the initial velocity!](#) [Watch the vertical scale!]

[Or go back to the original conditions.](#)

- E) What happens to the time it takes to reach the top if the initial velocity is doubled?

Answers

- A) The vertical maximum should be about 5.1 meters.
- B) The initial velocity of the Hammer is 10 m/sec
- C) The Hammer should go take 2.04 seconds to come



Effect of appropriate design

appropriate design => clarity

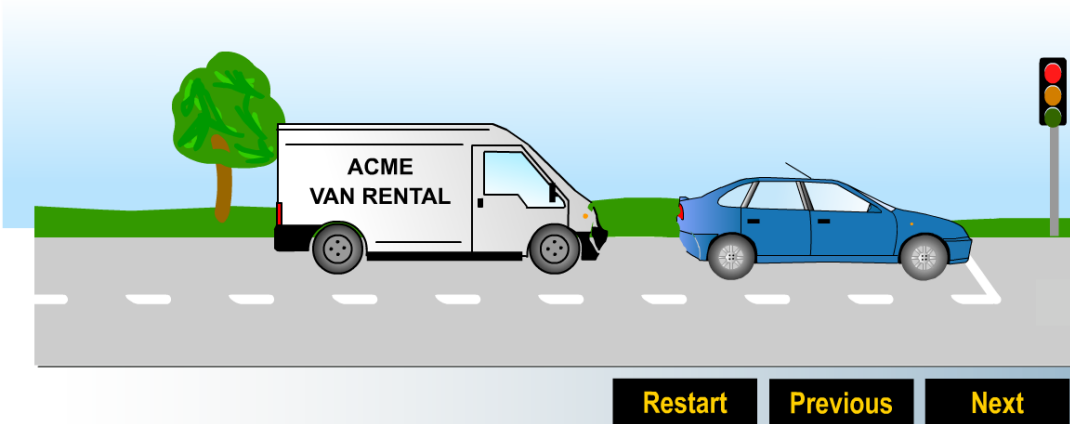
tion 1 - T... Reflection and Refraction Cricinfo - 5th ODI: India v Engl... Loading... Loading... FR2003080712042

➔ **Laws of Motion**

If the van were to abruptly stop and the straps were no longer functioning, then the ladder in motion would continue in motion. Assuming a negligible amount of friction between the van and the ladder, the ladder would slide off the top of the van and be hurled into the air.

Once it leaves the roof of the van, it becomes a projectile and continues in projectile-like motion.

Replay animation **▶**



Restart **Previous** **Next**

Project OSCAR (oscar.iitb.ac.in)

OSCAR Main Page - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://oscar.iitb.ac.in/oscarHome.do>

Google Search Popups okay ABC Check AutoLink AutoFill Options

KReSIT Karve Institute of School of Information Technology

Project OSCAR
Open Source Courseware Animations Repository

IITB

Home
About OSCAR
Animations
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➔ Suggest
➔ Submit
➔ Develop
➔ Available
Discussion Forum
Sites for Reference

Search the Repository

Keyword:

or

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➔ Suggest Animation ➔ Submit Animation

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OSCAR Programming Contest

The main goal of Project OSCAR (Open Source Courseware Animations Repository) is to create a repository of web-based, interactive animations for teaching various concepts and technologies.

The concepts range from high school to advanced topics in many areas. Each animation is typically a Java Applet that focusses on one concept and enables the user to learn about the concept in an interactive manner.

All the material developed in this project are Open Source Courseware. Permission is granted for download/use/modification/distribution of this material, for non-commercial purposes; standard "public-domain" rules. Please be kind enough to acknowledge the original authors.

Registrations:110 Developers:96 Mentors:14 Projects:59 Hit Count Since 28-02-2006 **001880**

Contact Us **Feedback**

Done Local intranet

start 10.129.1.3 - mals - ... 10.129.203.1 - defa... OSCAR Main Page - ... oscar Microsoft PowerPoin... 12:47 PM

Project OSCAR: example

Sliding Window Protocol - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Address <http://oscar.itb.ac.id/onsiteDocumentsDirectory/tcp/tcp/index.html>

Demo Configure Pause Resume Reset Help Analysis Step About us Download

Simulation of Sliding Window Protocols

Sender Window **Receiver Window**

List of Protocols

- Stop n Wait (SnW)
 - Without Error
 - With Lost Packet
 - With Lost Ack
- Go Back n (GBN)
 - Without Error
 - With Lost Packet
 - With Lost Ack
- Selective Repeat (SR)
 - Without Error
 - With Lost Packet
 - With Lost Ack

Go!

SENDER

RECEIVER

Packet No.	Timeout
1-5-9	
2-6-10	
3-7-11	
4-8-12	

- Frame
- Acknowledgement
- Frame lost
- Ack lost
- Sliding Window

Applet New started

Local intranet

start 10.129.1.3 - m... 10.129.203.1 - ... OSCAR Main Pa... Sliding Window ... oscar Microsoft Power... 1:18 PM

OSCAR on Mobiles

Technological issues in migration (Desktop to Mobiles):

- Form Factor
- Interactivity
- File Size





Fun with Science

Science Popularization:
(ArvindGuptaToys.com)

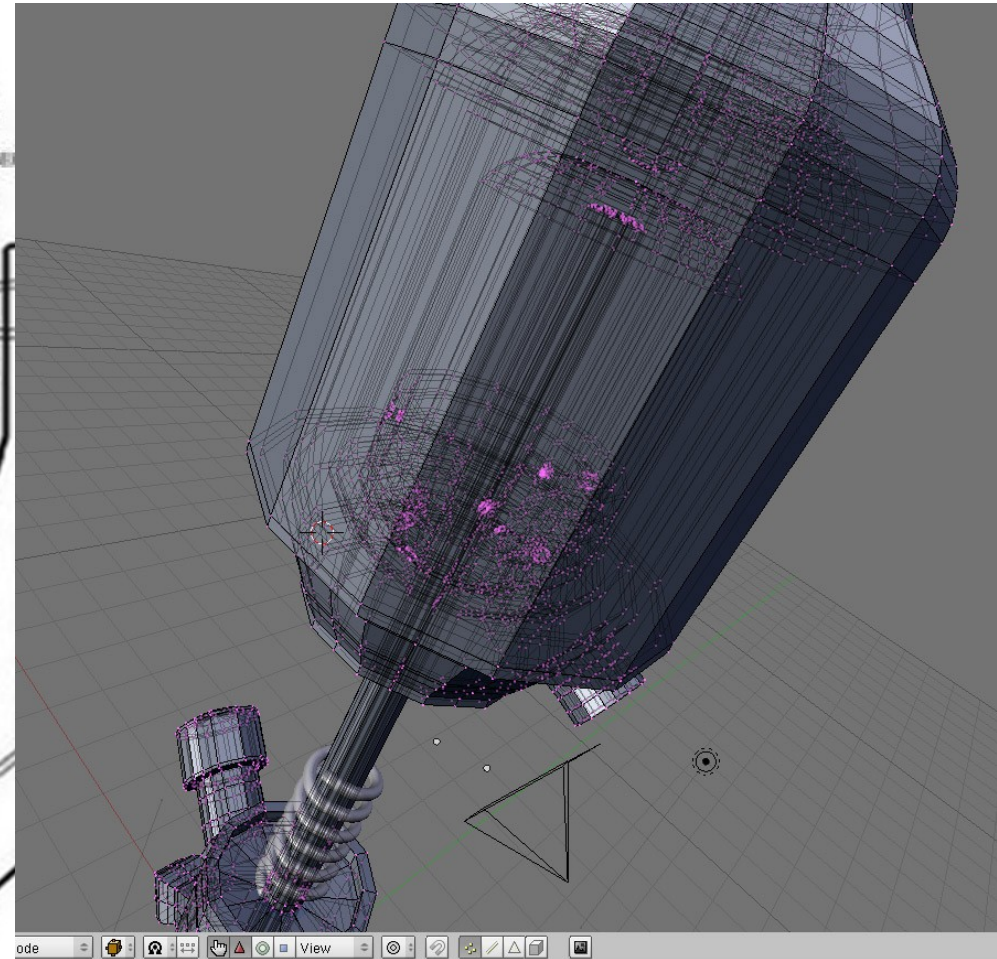
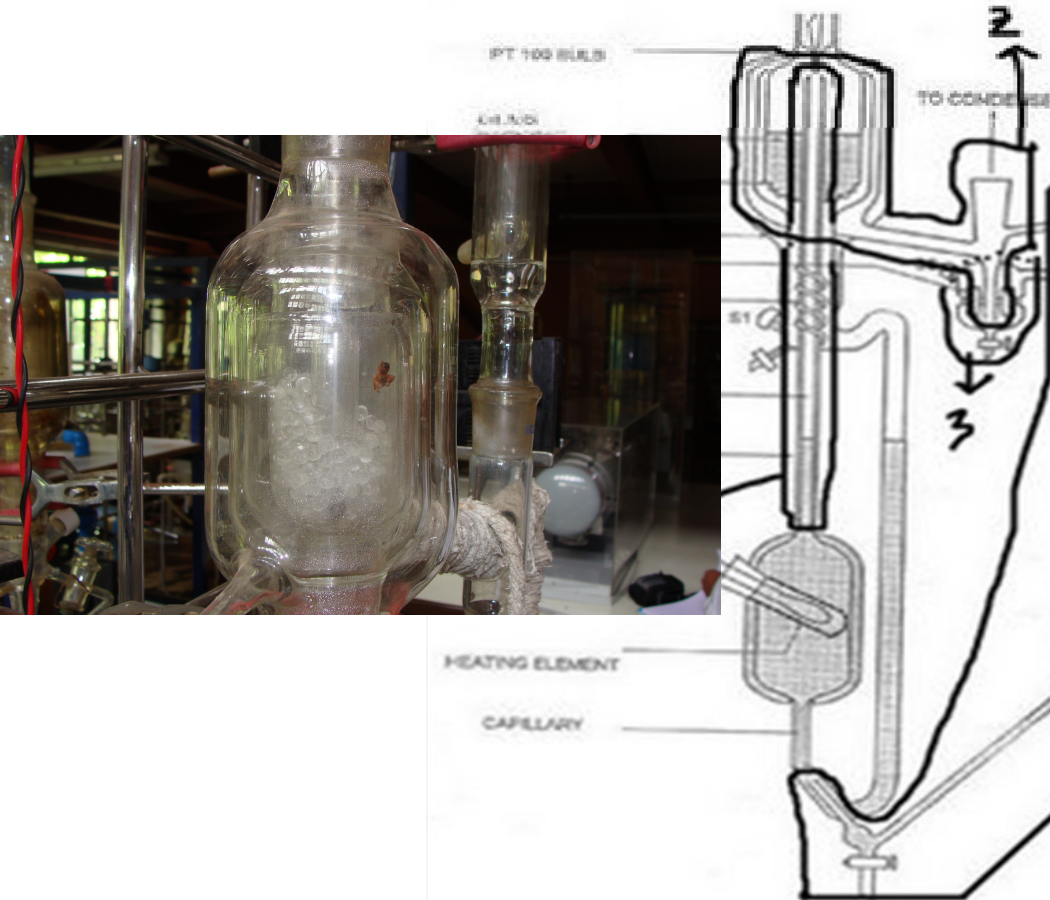
Captures interest

Entertains and educates

Opportunities for rural
entrepreneurship



Advanced Lab Experiments (Blender)



Take Away

- Decisions on appropriateness and quality of content are key!
 - Otherwise lot of effort can go into creating ineffective content.
- Fine-grain modules are likely to be more useful than monolithic.
 - Interactivity is essential in most cases.
- Look for Open Source or Creative Commons content repositories before creating your own.
 - Release your own work into above repositories.
- Quality contents will require collaboration among experts in:
 - Domain (Teachers)
 - Technology (Programmers)
 - Design (Artists)

Some useful resources

- <http://www.oercommons.org/>
- <http://learn.creativecommons.org/>
- <http://ocw.mit.edu/>
- <http://cnx.org/>
-
- <http://nptel.iitm.ac.in/>
- <http://www.cdeep.iitb.ac.in/>

Thank you

Contact information

<http://www.cse.iitb.ac.in/~sri>

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