



United Nations
Educational, Scientific and
Cultural Organization

UNESCO Bangkok
Asia and Pacific Regional Bureau
for Education

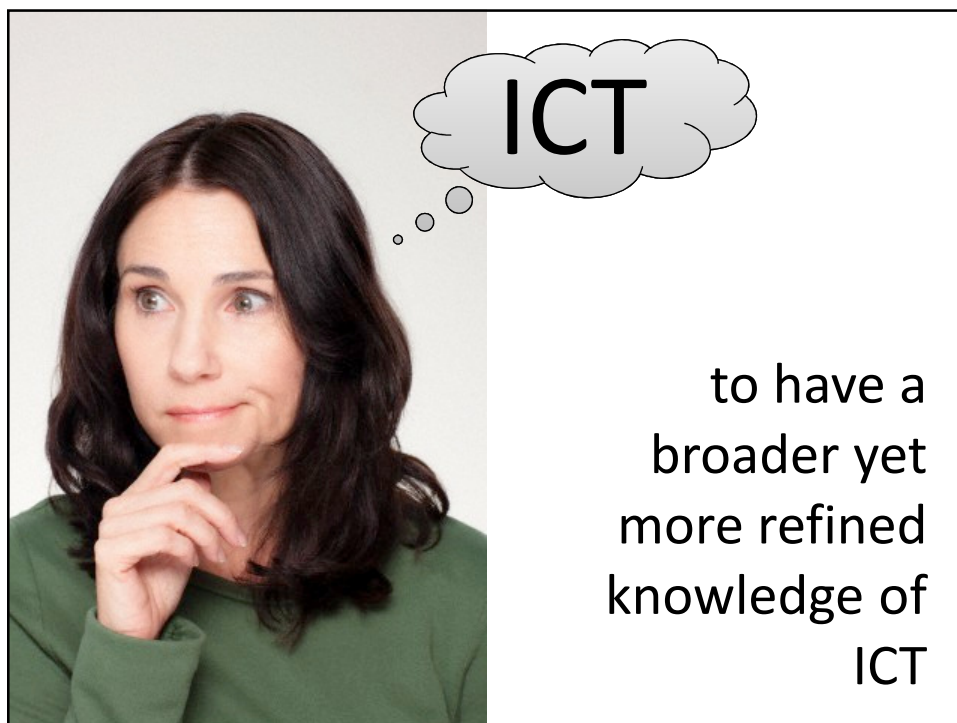
Designing Learning Objects using Multimedia Resources

Hartfried Schmid
UNESCO-Bangkok

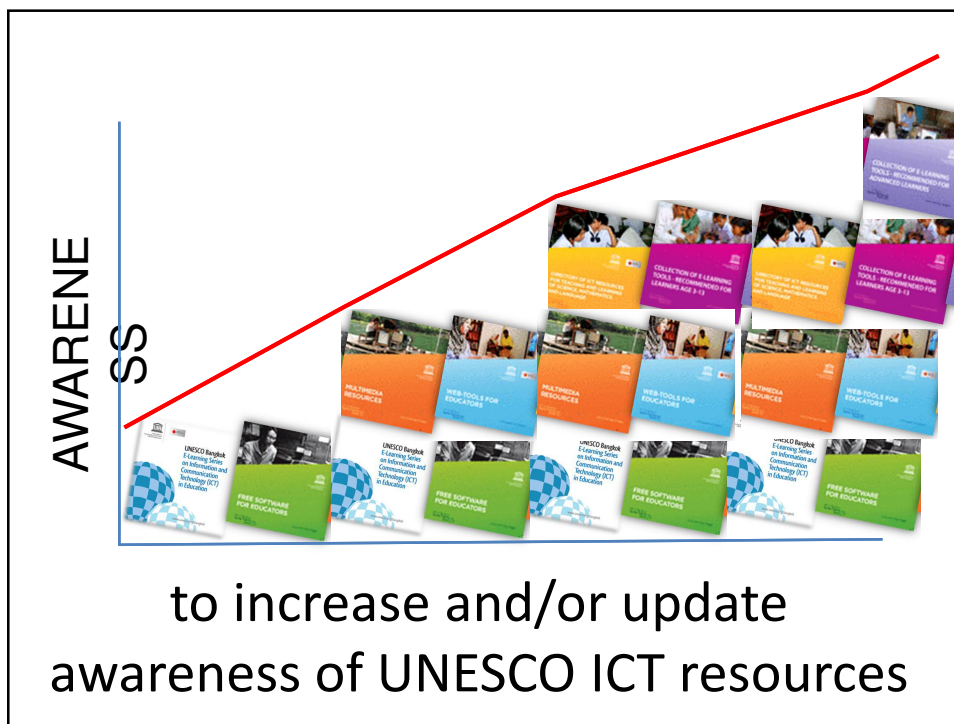


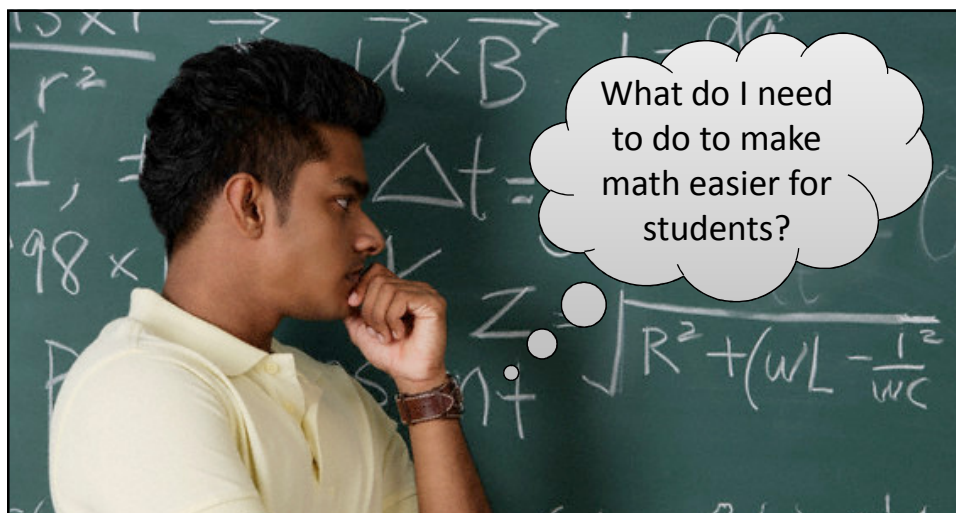


Our Training Objectives



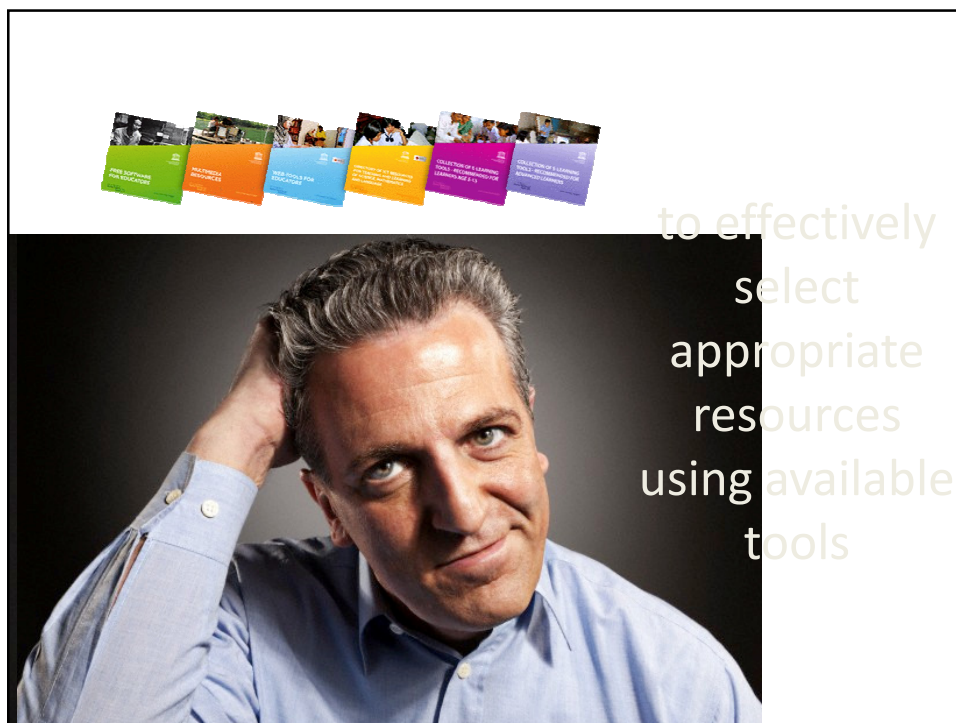
to have a
broader yet
more refined
knowledge of
ICT





What do I need to do to make math easier for students?

to identify the needs of their particular teaching-learning contexts while keeping their areas of specialization in mind



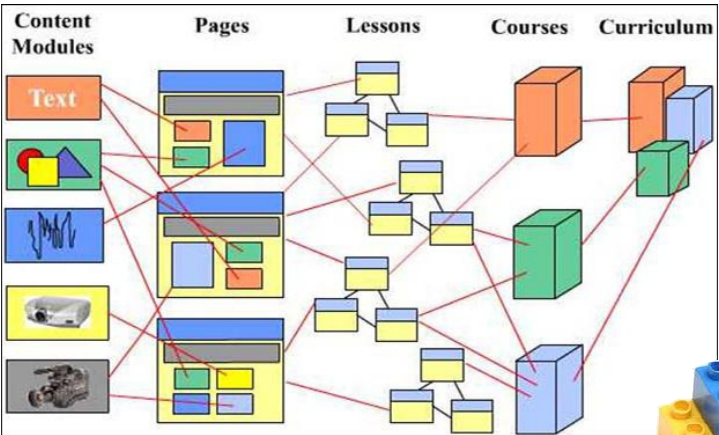
to effectively select appropriate resources using available tools

to plan and eventually implement a training program for their respective institutions



The image shows a man in the bottom right corner looking thoughtful, with his hand on his head. Above him is a large thought bubble containing a photograph of three people (two men and one woman) gathered around a computer monitor, appearing to be in a collaborative meeting. Below the main thought bubble are two smaller, empty thought bubbles.

Learning Objects



The diagram illustrates the hierarchy of Learning Objects. It is organized into five columns: Content Modules, Pages, Lessons, Courses, and Curriculum.

- Content Modules:** Includes icons for Text, a geometric shape (circle, square, triangle), a hand-drawn scribble, a car, and a globe.
- Pages:** Shows three sample page layouts with various colored boxes representing content elements.
- Lessons:** Displays a network of small yellow and blue boxes connected by lines, representing individual learning objects.
- Courses:** Shows several 3D rectangular blocks in orange, green, and blue.
- Curriculum:** Shows a few more 3D rectangular blocks in orange, blue, and green.

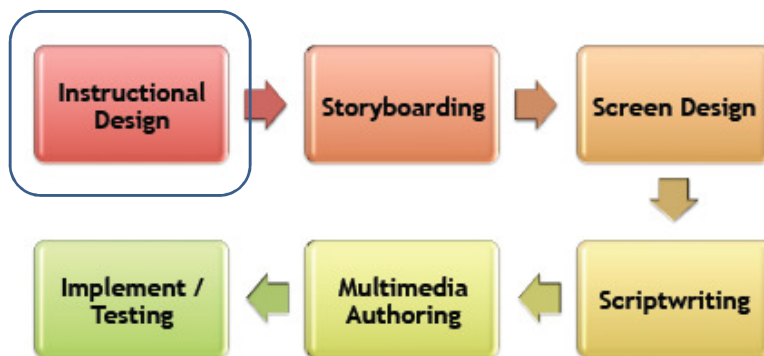
 Red lines connect the Content Modules to Pages, Pages to Lessons, Lessons to Courses, and Courses to Curriculum, showing how smaller objects are assembled into larger educational structures. In the bottom right corner, there is a small cluster of colorful LEGO bricks (blue, green, red, yellow).

Santally, and Senteni (2). A Learning Object Approach to Personalized Web-based Instruction
<http://www.eurodl.org/?article=166>

Sample Learning Objects

- [Video/ animation/ audio clip](#)
- http://education.uoit.ca/lordec/ID_LORDEC/water_cycle/
- <http://phet.colorado.edu/en/simulation/fractions-intro>

Development Process - Developers' Perspective



Slide from: eSkwela Content Development Training, 2008

Instructional Design

What for?

The quality of your content begins with a good and grounded instructional design/ plan that integrates the different elements of instruction into a cohesive whole.

- Diaz & DeClaro

Instructional design is more than just putting information in front of the learners.

What am I supposed to do with all of this information?

The role of the instructional designer is to **help the learners make sense of the new information** they get.

What Everybody Ought to Know about Instructional Design (July 2008). The Rapid E-learning Blog. <http://www.articulate.com/rapid-elearning/what-everybody-ought-to-know-about-instructional-design/> (Accessed: October 2012)

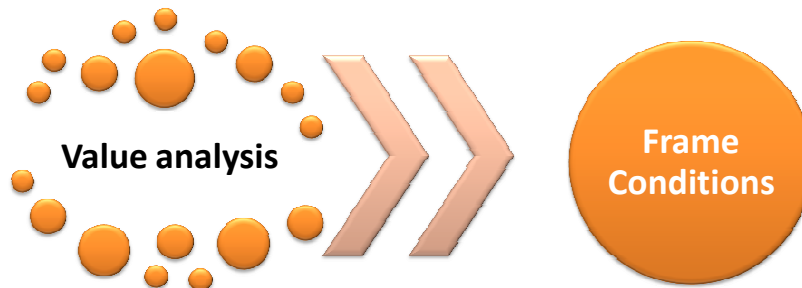
15

Instructional Design

- has clear goals and gets learners focused on the right things
- provides context and perspective
- compresses the learning process and saves time
- engages learner with clear and meaningful content

What Everybody Ought to Know about Instructional Design (July 2008). The Rapid E-learning Blog. <http://www.articulate.com/rapid-elearning/what-everybody-ought-to-know-about-instructional-design/> (Accessed: October 2012)

Considerations



- Is there a “need”?
- How is it going to be used?
- For what purpose (contribution)?

- learning objectives and content
- learners’ & teachers’ context
- learning environment and conditions (access, support)
- resources (funds, people, time)

LO Design

- Stick to the essential content, based on the topic and learning objective/s
 - Appropriateness of text, objects/media
 - Type of activity
 - Level of interactivity
 - Form of assessment and feedback
 - Tools to use

LO Design

- Content:
 - simplify, contextualize, localize
 - chunking and sequencing
- Interface / Object design and layout
 - layout of elements, background, colours, navigation, animation, etc.
- Reusability

Resource Selection

Traditional, non-electronic formats

- Text (textbooks, printouts, worksheets, manuals, pamphlets)
- Printed visuals (posters, photos, illustrations, comics, maps, graphs)
- Displayed visuals (chalkboards, bulletin boards)
- Real objects and models

Electronic/ ICT media

- Projected visuals (overhead transparencies, presentation slides)
- Audio media (radio, podcasts, audiotapes, voice recordings)
- Video media (motion pictures)
- Multimedia and other computer-based media (programmes and applications)
- Internet media (online resources), including web tools

Feature Analysis Matrix

From Newby, T. J., et al (2006). Educational Technology for Teaching and Learning (3rd ed.)

Resource Selection

Where will the content be sourced?

- Bought? Borrowed?
- Internet portals/sites?
- Teacher-generated? Learner-generated?
- Professional development team? In-house or outsourced?
- Shared across institutions?

Selection criteria

Extent of interactivity

The quality of your content begins with a good and grounded instructional design/plan that integrates the different elements of instruction into a cohesive whole.

While ICT has a positive impact, it is not the end-all and be-all of teaching and learning. Instruction is enhanced by ICT, but can still be effective even without it.

Avoid ICT Abuse!

- Diaz & DeClaro

To use or not to use ICT

Pair Activity: Lesson ICT Integration Plan

Possible Integration Points

motivation
and lesson
intro

presentation
and
information

application

drill and
practice

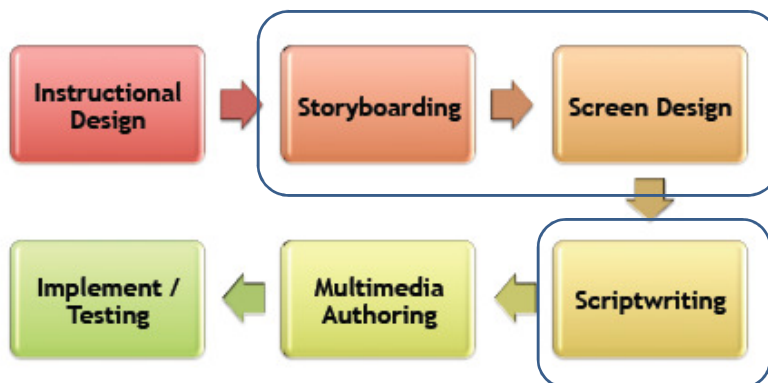
assessment

synthesis
and closing

Avoid ICT Abuse!

* Diaz, C. & DeClaro, R (2012). UNESCO Training Guide on ICT Multimedia Integration for Teaching and Learning.

Development Process - Developers' Perspective



Slide from: eSkwela Content Development Training, 2008

Decisions, decisions

Item	Considerations
Text	<ul style="list-style-type: none"> • Font color, size, type • sentences or phrases 1. numbers or bullets • Table or prose; table or graph (type)
Visuals	<ul style="list-style-type: none"> • Background • Photo or illustrated • static or moving • combination and arrangement • Others: timeline, diagrams
Movement	<ul style="list-style-type: none"> • Animation or video • Sourced or developed • Linear or interactive

Decisions, decisions

Item	Considerations
Audio	<ul style="list-style-type: none"> • Yes or no • music or voice • constant or highlights • sound effects?
Links	<ul style="list-style-type: none"> • Yes or no
Interactivity	<ul style="list-style-type: none"> • Yes or no • Navigation/menu design • programming (e.g. games)
Others	

Available Resources

- UNESCO's CD collection – refer to list provided
- Phet (sample: [Eating and Exercise](#))
- MIT OpenCourseware
- Hippocampus
- UP-DILC podcasts and learning objects
- MERLOT
- OpenLearn
- Khan Academy
- Physion
- UNU Open Course Ware
- Apple Learning Interchange
- Nobelprize.org (sample: [Blood Typing](#))
- Edheads.org (sample: [Simple Machines](#))
- Intel's skool
- Youtube
- BrainPOP
- etc. etc. etc.



[How We Became Green](#)

<http://www.youtube.com>

MALARIA
Facts from the
GOOD MOSQUITO!

Type your name in this box and click go

I am the Female Anopheles Mosquito. I will show you how I cause and spread Malaria.

First, I bite a person with Malaria and I suck a little blood.

Then I bite another person and I put some infected blood into his blood.

Then I bite many more people and infect them with the Malaria Parasite. It takes some days for the infected person to fall ill with MALARIA.

With a mosquito net, we can not get into it to bite you when you sleep. You will be safe in it.

The net should be small-meshed, with no holes, and tucked in under the bottom sheet. During the day, it should be rolled up, so mosquitoes and other insects can't get inside while it's not in use.

You can also destroy breeding places of my wicked mosquito friends. They live in weedy grass areas around stagnant water. They can be controlled in your own area by spraying, cutting shrubs and grasses, cleaning gutters, and also keeping the environment clean and fresh.

Can you point to some places below that we can breed and hide?

<http://www.eSchoolToday.com>

Stages in voice production

artulators

lips

jaw

hard and soft palates

tongue

teeth

download audio files

home

back | menu | next

©2009, University of the Philippines. All rights reserved.

<http://www.dilc.upd.edu.ph/>
(Speech Communication, Voice and Diction: Effective Speaking Voice)

<http://www.hippocampus.org>
(General Physics, Equations of Motion)

Problem Statement
 ▶ Instructions
 Ball 1 is dropped from a height of h_1 m.
 At the same time, Ball 2 is thrown downward from a different height of h_2 m, which is also unknown.
 Use the simulation and analytical calculations to determine the value of h_2 .
Air resistance is neglected!

Enter a value for v_{02} :
 $v_{02} =$ m/s **Run simulation**
 Last guess: 30 m/s
 Result: Ball 1 landed first

Calculations
 Now that we have the right values for v_{02} and t we can substitute their values into the displacement equation in order to calculate our desired height, h_2 .
 $v_{02} = 44$ m/s $t = 14.1$ s
 Displacement equation for Ball 2:
 $h_2 = v_{02}t + \frac{1}{2}gt^2$
 $h_2 = (44 \text{ m/s})(14.1 \text{ s}) + \frac{1}{2}(9.8 \text{ m/s}^2)(14.1 \text{ s})^2$
 $h_2 = 1609 \text{ m}$
Continue

The two balls landed at the same time. Be sure to note the velocity v_{02} and the time t .
 Enter your answer for h_2 , using $v_{02} = 44$ m/s, $t = 14.1$ s.
 $h_2 =$ m **Check answer**

The Circulatory System
 Water and carbon dioxide
 Scale: 6.4 x 10⁸
 Capillaries are spread through body tissue so that substances such as dissolved food, oxygen, and waste substances can easily diffuse into and from the blood.

Blood and Circulation
 Researcher: [Name]
 Copyright © 2010 Intel Corporation

Blood and Circulation
 Researcher: [Name]
 Copyright © 2010 Intel Corporation

Labels in the third screenshot:
 Pulmonary Artery (deoxygenated blood to the lungs) Aorta (oxygenated blood to the rest of the body)
 Vena Cava (deoxygenated blood from the rest of the body) Pulmonary Vein (oxygenated blood from the lungs)
 Right Atrium Left Atrium
 Right Ventricle Left Ventricle
 Septum Heart Out

Intel's skool site: <http://skool.net.ph>
 – Sophomore, Biology, Breathing sim

Use of available resources

Benefits

- Readily available pool of resources
- Affords flexibility
- Can combine learning objects

Challenges

- Some: costly
- Must have sound evaluation mechanism
- Need to be customized/ localized
- For most: editing and embedding functions
- IPR concerns

Development Process

- Developers' Perspective



Slide from: eSkwela Content Development Training, 2008

Teacher/ Learner-developed

- Word processor
- Spreadsheet
- Slide Presentation
- Video or audio recording
- Website
- Album
- Blog
- Wiki
- Forum
- eXe Learning
- Xerte
- CourseLab
- Adobe Authorware
- Etc.



Teacher-developed

Benefits	Challenges
<ul style="list-style-type: none"> • Affords flexibility • Customized to own set of learners • Can combine learning objects 	<ul style="list-style-type: none"> • Requires time and effort • IPR concerns

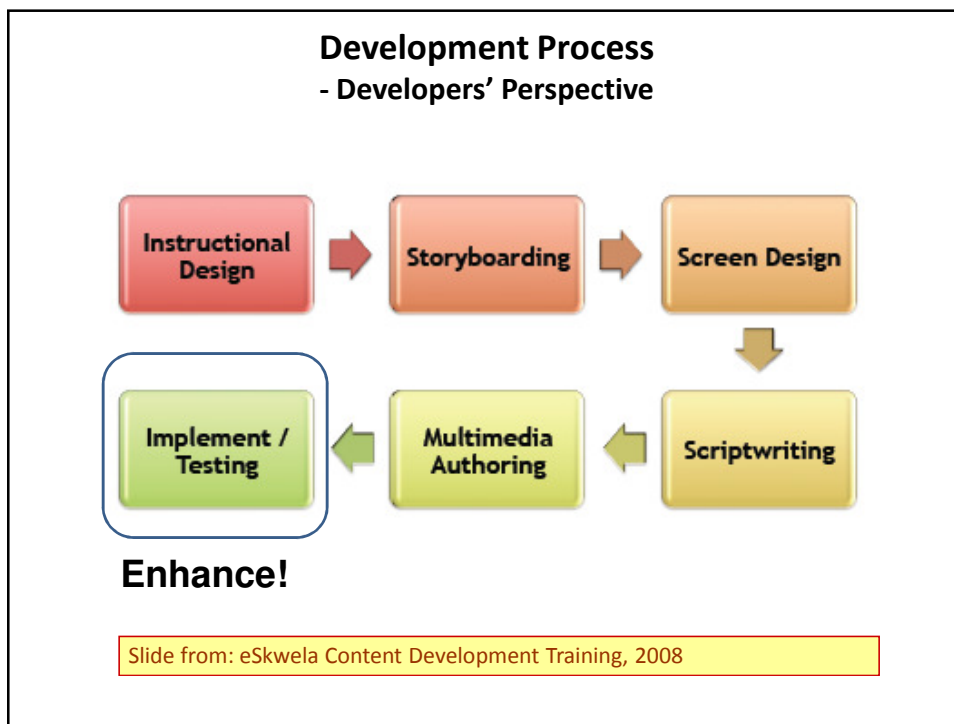
Common Authoring Tools

- Slide Presentation software ([demo1](#), [demo2](#))
- Blogs and wikis (can embed files and widgets) ([demo](#))
- Learning Tools (<http://www.learningtools.arts.ubc.ca/>)
 - Multimedia Learning Object Authoring Tool ([demo](#))
 - Timeline ([demo](#))
- eXe Learning (<http://exelearning.org/wiki>)
- Xerte (<http://www.nottingham.ac.uk/xerte/>)
 - LO [demo](#)

TIPS

application	useful tools
Slide presentations	master slides, shapes, SmartArt, animation / motion path (t1 , t2), hyperlinks, rehearse timings / record slide show Site: http://www.articulate.com/rapid-elearning/
Image editing	downloading, print screen, crop, brightness/contrast, resize, rotate/flip
Video production and editing	angles, lighting, sound, cut and fade

Ask for permission, cite sources



THANK YOU!

h.schmid@unesco

<http://www.unescobkk.org/education/ict/>

Links used

- Kiwi demo: <http://video.about.com/australianfood/Kiwis.htm>
- DNA: <http://www.brainpop.com/health/geneticsgrowthanddevelopment/dna/>
- Water cycle: http://education.uoit.ca/lordec/ID_LORDEC/water_cycle/
- Fractions: <http://phet.colorado.edu/en/simulation/fractions-intro>
- Eating and Exercise: <http://phet.colorado.edu/en/simulation/eating-and-exercise>
- Blood Typing: <http://nobelprize.org/educational/medicine/landsteiner/landsteiner.html>

Links used

- Speech Communication, Voice and Diction: Effective Speaking Voice: http://www.dilc.upd.edu.ph/media/lo/speechcom/LO_1version4.swf
- General Physics, Equations of Motion: <http://www.hippocampus.org/Physics;jsessionid=9FAB9418BA17F0EA2B5798DE37A32B55>
- Breathing simulation game: <http://skool.net.ph/files/SIMS/Biology/Humans%20As%20Organisms/breathing%20and%20respiration/index.html>
- Moving Hand: <http://cdn.articulate.com/images/blogs/wom/demos/NutritionLabels/player.html>

Links used

- Earthquake Scenario: http://articulate.www.resources.s3-website-us-east-1.amazonaws.com/community/blogdemo/remittance_branch/player.html
- Tutorials on Motion Paths in PPT:
 - <http://www.screenr.com/yjd>
 - <http://www.screenr.com/noG>
- Xerte demo:
<http://www.nottingham.ac.uk/xerte/media/loDemo/rloObject.htm>