

What are RLOs?

R
Reusable

L
Learning

O
Objects

Reusable Learning Objects



Introduction

.... a short story of a teacher.



Extension Material

The screenshot shows a Microsoft Internet Explorer browser window. The title bar reads "Total Maximum Daily Loads and Agricultural BMPs in Florida - Microsoft Internet Explorer". The address bar shows the URL "http://edis.ifas.ufl.edu/UE-285". The page content includes the University of Florida IFAS Extension logo and the EDIS logo. The main heading is "Total Maximum Daily Loads and Agricultural BMPs in Florida¹". Below the heading, the authors are listed as "Kati W. Migliaccio and Brian J. Bonan²". The section "Introduction" begins with the text: "In 1972, Congress passed the Clean Water Act which set forth federal requirements for identification of polluted or impaired water bodies. These rules were passed down to the states by the U.S. Environmental Protection Agency (EPA) which required states to establish a prioritized list of impaired water bodies and to develop estimated loads that the water bodies could receive of each pollutant while meeting water quality standards (DeBusk, 2001).". The next paragraph states: "These estimated loads determined for each water body are called Total Maximum Daily Loads (or TMDLs). TMDLs are defined as the maximum amount of a pollutant that a waterbody can receive and still meet the water quality standards as established by the 1972 Clean Water Act. Section 303(d) of the Clean Water Act requires states to submit lists of surface waters that do not meet applicable water quality standards and to establish TMDLs for these waters on a prioritized schedule.". The final paragraph reads: "In response to state TMDL requirements, the Florida Watershed Restoration Act (FWRA) (s. 403.067 F.S.) was passed in 1999. This act identified the methods that the Florida Department of Environmental Protection (FDEP) would use to develop and implement TMDLs. Specifically, the FWRA requires that TMDLs include all pollutant sources (agriculture and urban), and:".



Extension Material

RWC: Publications - Extension Materials - Windows Internet Explorer

http://www.rwc.cgiar.org/Pub_Main.asp?c=9&cn=Extension+Materials

Rice-Wheat Consortium
for the Indo-Gangetic Plains

The RWC Themes Publications Farmer Services Interactive Contact Us

RWC-PRISM Search
Organization Project Person Practice
-Enter search str Find Advanced Search Interact

Home | Portal > Publications > Extension Materials

Publications - Extension Materials

The RWC maintains a library of various research, periodical and other publications. These publications are available online in a variety of document formats.

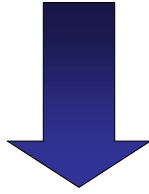
Publications Available

- Bibliography of Soil Science Research at NARC**
Correct Citation: Rashid, A. and N. Dughio (2004) Bibliography of Soil Science Research at NARC. Pakistan Agricultural Research Council, Islamabad, Pakistan. vii + 107 pp.
- Brochure for RWC-PRISM. Project and Research Information System Module**
Correct Citation: RWC. 2002. Brochure for RWC-PRISM:Project and Research Information System Module. Rice-Wheat Consortium for the Indo-Gangetic Plains, New Delhi, India.
- Crop Plus+ India: Wheat Crop Information Card (English/Hindi)**

Done Internet 100%

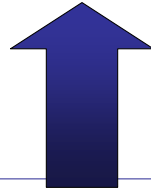


Traditional Teaching - Expert Knowledge



Empower Learners

- Sharing
- Participation
- Create learning content



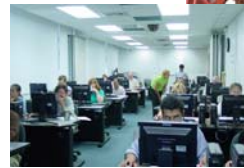
Web 2.0



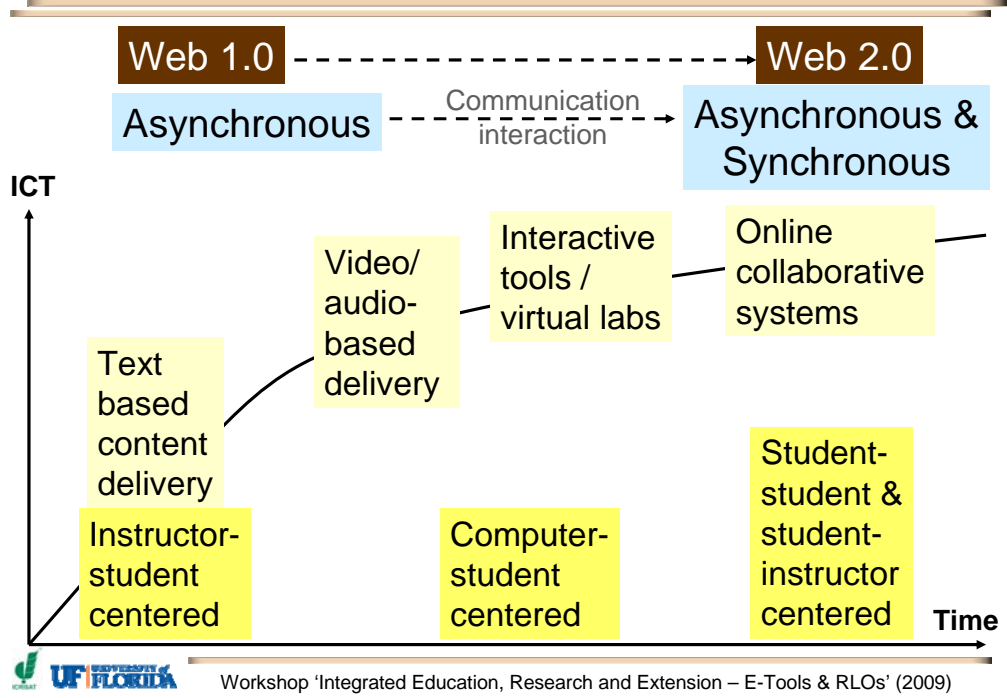
Teaching



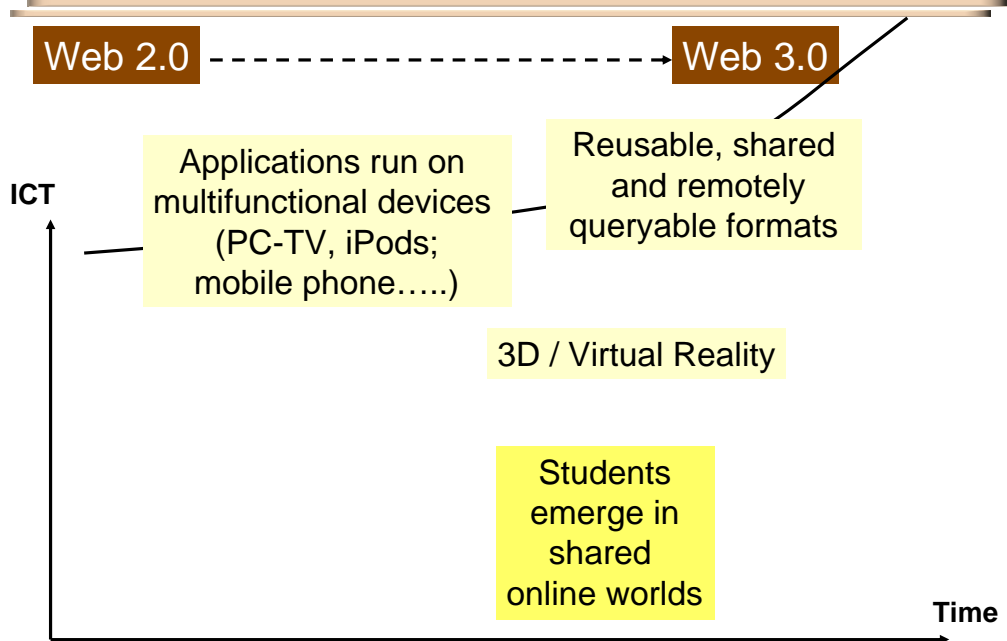
Learning



Trends – eLearning



Future Trends – eLearning



Digital Libraries



<http://www.merlot.org>



<http://www.icrisat.org/vasat/>



Digital Library for Earth System Education

<http://www.dlese.org>



Online Collections & Encyclopedias

The slide displays five online resources:

- Wikipedia:** Logo featuring a globe with letters, with the text "WIKIPEDIA The Free Encyclopedia" below it. URL: <http://en.wikipedia.org>
- Connexions:** Logo with the word "CONNECTIONS" in a blue box and a stylized orange 'X'. Navigation buttons for "Home", "Content", "About Us", and "Help" are visible. URL: <http://cnx.org/>
- Wikiversity:** Logo with a globe and the text "WIKIVERSITY". A sidebar lists various subjects like Humanities, Physical Sciences, Life Sciences, etc. URL: <http://en.wikiversity.org>
- Google Scholar:** The Google logo with "Scholar" in green and "BETA" in small letters. URL: <http://scholar.google.com/>
- Project Gutenberg:** Logo with the text "Project Gutenberg" in a stylized font. URL: <http://www.gutenberg.org>

At the bottom left is the UF Florida logo, and at the bottom center is the text: "Workshop 'Integrated Education, Research and Extension – E-Tools & RLOs' (2009)"

Project Gutenberg: A library of 17000 free ebooks whose copyright has expired in the USA Book listings, search engine, newsletter, articles and information on how you can help

Connexions: a place to view and share educational material made of small knowledge chunks called modules that can be organized as courses, books, reports, *etc.* Anyone may view or contribute:

authors create and collaborate

instructors rapidly build and share custom collections

learners find and explore content

Wikiversity: [Welcome](#) to Wikiversity, a [wiki](#) website where you are invited to explore your learning goals and [participate](#) in [active learning projects](#). Everyone is welcome to help [create](#) and develop [learning resources](#).

Online Learning Resources

Limited resources:

- Agriculture
- Soil and water sciences
- Environmental sciences

Characteristics – Reusable Learning Objects

- (1) Digital / web-based (24/7)
- (2) Reusable –
multiple context; multiple purpose; multiple times
- (3) Self-contained –
specific topic / learning objective
- (4) Small in size –
to focus learners attention (2-15 min.)
- (5) Standardized –
RLOs follow the same organizational structure; free of look-and feel of formatting to be reused in multiple delivery media
- (6) Searchable –
tagged with metadata (data that describe the RLO)



Characteristics – Reusable Learning Objects

(7) Flexible –

easy to update; easy access to quality teaching and learning resources for a wide range of learners

(8) Aggregate –

build larger modules, courses or curricula

(9) Suited for new types of learners –

learner-centered

(10) Cost-effective –

*avoid duplication / redundancy of learning materials;
intellectual capital*

Reusable Learning Object



Source image: Google.com Images

An RLO is an independent and self-standing unit of learning content that is predisposed to reuse in multiple instructional context (Polsani, 2003)



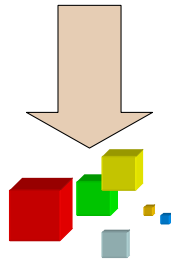
Workshop 'Integrated Education, Research and Extension – E-Tools & RLOs' (2009)

Polsani P R.2003. Use and Abuse of Reusable Learning Objects. Journal of Digital Information, Vol 3 Issue 4 Article No. 164. Online at <http://jodi.ecs.soton.ac.uk/Articles/v03/i04/Polsani/>.

Wiley D.A (ed.). 2002. The instructional use of learning objects. Agency for Instructional Technology and Association for Educational Communications & Technology, Bloomington, IN.

RLO – The Objective is to Learn

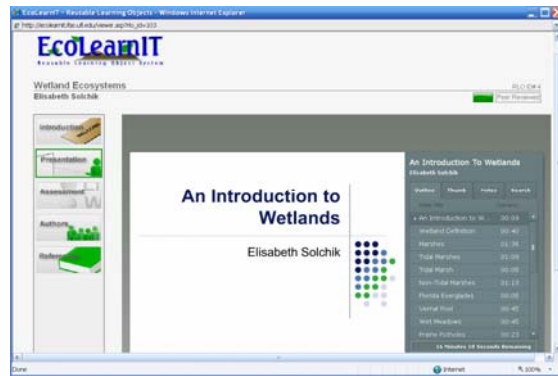
- A RLO is a type of online instruction that provides a digital educational resource that can be reused, scaled and shared from a central online repository in the support of instruction and learning
- Each RLO supports a single learning objective



RLO Size

- They vary in size, scope and level of granularity ranging from small chunks of instruction to a series of combined resources to provide a more complex learning experience.

~ 17 min.



RLO Size

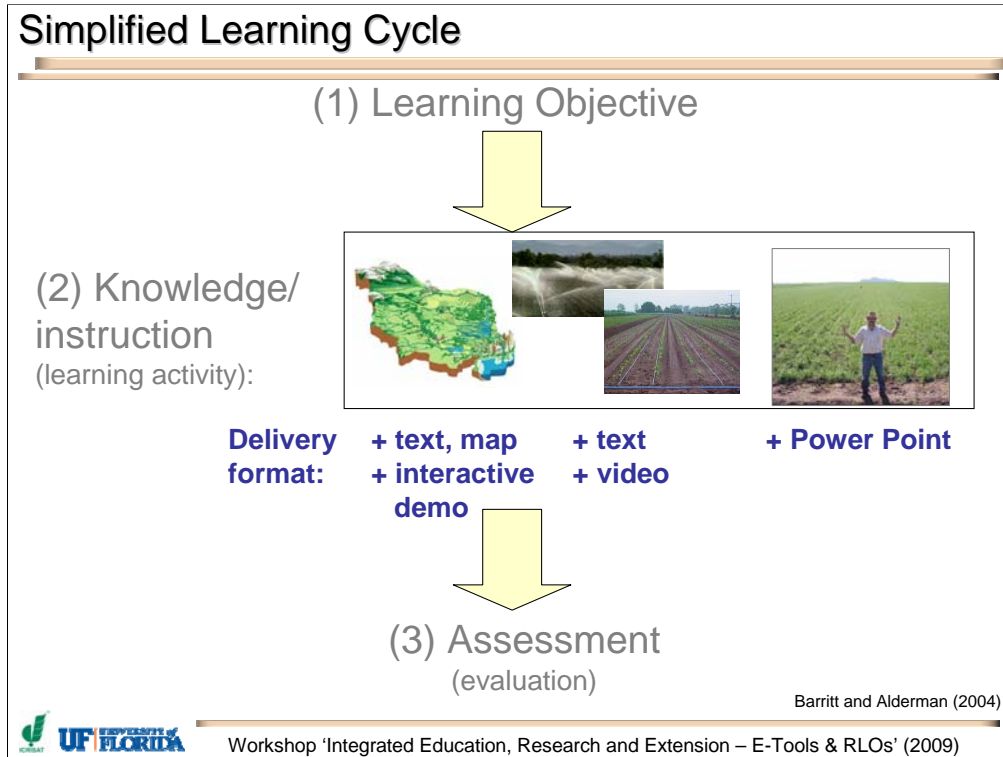
The image displays two screenshots from the EcoLearnIT system. The top screenshot shows a course overview for "Types of Soil Maps" by Bernard Panjer. It includes a navigation menu on the left with options like Introduction, Presentation, Assessment, Authors, and Rubric. The main content area features a diagram with three maps and a circular arrow indicating a process. To the right, there is a section for "RLO OR 1" with details: Published (2007/08), Learning Objectives (To understand different types of soil maps), Rating (Great learning material), and Target Audience (Biological/soil level (B.S.)). The duration is noted as "<math>< 5 \text{ min.}</math>".

The bottom screenshot shows a video player for "Raster and Vector in GIS" by Xiaolin Sui. The video title is "Raster and Vector in GIS" and the author is "Xiaolin Sui". A table of contents is visible on the right side of the video player, listing various topics and their durations:

Topic	Duration
Raster and Vector in GIS	00:09
Vector Data Model	00:17
Vector Data Model	00:26
Raster Data Model	00:26
Raster Data Model	00:24
Vector vs. Raster	00:18
Pros and Cons for Ve...	00:27
Pros and Cons for Ra...	00:52
Conversion from Vect...	00:58

The video player interface includes a navigation bar at the bottom with "Slide 1 / 4 | Slideshow" and a progress indicator. The duration is noted as "$\sim 7 \text{ min.}$".



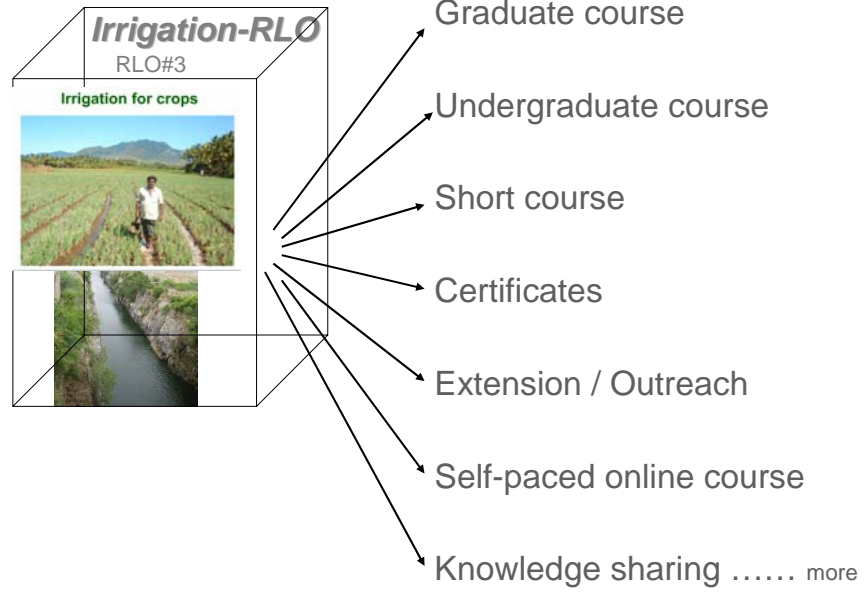


LO is defined as the smallest independent structural experience that contains an objective, a learning activity and an assessment

- (1) Learning objective
- (2) A unit of instruction that teaches the objective
- (3) A unit of assessment that measures the objective

Barritt C. and F.L. Alderman. 2004. Creating a Reusable Learning Objects Strategy. John Wiley & Sons, San Francisco, CA.

Multiple Purpose RLOs



Learning Objects

- Reusable Learning Objects
- Data object ~ information object ~ content object
- Learning Objects (McGreal, 2004; Koohang and Harman, 2007)
- Online Learning Objects
(MERLOT; DLESE; Ariadne, 2000; ESCOT; 2000)
- Knowledge objects (Merrill et al., 1991)
- Instructional object (Gibbons and Nelson, 2002)
- Intelligent object (Zimmerman and Bomme, 2002)



Workshop 'Integrated Education, Research and Extension – E-Tools & RLOs' (2009)

- **Ariadne**: Alliance of remote instructional authoring and distribution networks for Europe (ariadne.unil.ch)
- **ESCOT**: Educational Software Components of Tomorrow – NSF-funded project (www.escot.org)
- **MERLOT**: Multimedia Educational Resource for Learning and Online Teaching (www.merlot.org)
- **DLESE**: Digital Library for Earth System Education <http://www.dlese.org/library/index.jsp>
- **SCORM**: Shareable Content Object Reference Model (XML-based specifications) - distributed through the Advanced Distributed Learning Initiative Network

References:

- Gibbons A.S. and J. Nelson. 2002. The Nature and Origing of Instructional Objects. In D.A. Wiley (ed.) The Instructional Use of Learning Objects. AIT/AECT, Bloomington, IN.
- Koohang A. and K. Harman (eds.) Learning Objects: Theory, Praxis, Issues and Trends. Santa Rosa, CA. Informing Science Press.
- McGreal R. (ed.) 2004. Online Education Using Learning Objects. Routledge, New York.
- Merrill M.D., Li Z. and Jones M. 1991. Instructional transaction theory: An introduction. Educational Technology 31(6): 7-12.
- Zimmerman TH. and B. Bomme, 2002. Toward intelligent object-oriented scientific applications. Engineering computational technology, 271 – 311.

- Standards: **SCORM** – Sharable Content Object Reference Model – developed by the U.S. Department of Defense – SCORM reference model is published by the Advanced Distributed Learning (ADL) Initiative
- Constructivist approach to learning – learning requires context
- Humans come to formal education (and training) with a range of prior knowledge, skills, beliefs and concepts that significantly influence what they notice about the environment and how they organize and interpret it. This in turn, affects their abilities to remember, reason, solve problems and acquire new knowledge