Authoring ODL educational material for the Web
Συγγραφή εκπαιδευτικού υλικού ΑεξΑΕ για τον Παγκόσμιο Ιστό

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Topics

1. Introduction
2. Online user's behaviour
3. The special characteristics of ODL educational material
4. The power of the Web and hypertext
5. Supporting Learning styles
6. Discussion and conclusion

Abbreviations:
ODL = Open & Distance Learning
MOOC = Massive open online course
ALE = Adaptive Learning Environments.
1. Introduction

In this paper we discuss the structure of ODL educational material to be offered via the Web, for achieving the maximum learning outcome.
We shall attempt to compose a set of basic guidelines taking into account principles from various fields, namely:

• authoring ODL educational material;
• presentation of an ODL portfolio;
• online reader's behaviour;
• web usability and
• learning styles and their support.
Intersection of different disciplines

- Web authoring
- Web usability
- ODL authoring
- Course portfolio
- Learning styles support
- OER
2. Online user's behaviour

Internet users act like being in a hurry.
- Time on the Web runs 7 times faster!
- The duration of the concentration span is 7 times smaller.
- Information overload leads to attention deficit.

It has been measured that:
- 79% of the users scan the page because they find it painful to read too much text on line; only 16% read word-by-word.
- Reading from screen is 25% slower and much more boring than reading from paper (Nielsen, 2000).
Online user's behaviour (2)

Internet users are not willing to read long pages online.

The Web is an informal and immediate medium compared to print; users appreciate an informal, “light” writing style, simple sentences and short paragraphs.

Therefore, it has been suggested that Web content should have half of the word count of the corresponding paper version (Nielsen, 2000).
The “Iceberg” presentation model

- Representative and comprehensive title
- Illustrative subtitle and representative image (=1000 words)
- Summary - conclusions
- The details

Read more (extended explanation)
Τριήμερη μάχη στη Βουλή
Ανεβαίνει το θερμόμετρο στη συζήτηση επί της πρότασης μομφής του ΣΥΡΙΖΑ

Συνεχίζεται το απόγευμα της Παρασκευής στην Ολομέλεια της Βουλής η τριήμερη συζήτηση επί της πρότασης δυσπιστίας κατά της κυβέρνησης, που υπέβαλε ο πρόεδρος της ΚΟ του ΣΥΡΙΖΑ και 71 βουλευτές του κόμματός του. «Η απάντηση δεν βρίσκεται μέσα σε αυτή τη Βουλή. Έξω από τη Βουλή θα δοθεί η λύση» είπε η Αλέκα Παπαρήγα, κατηγορώντας κυβέρνηση και ΣΥΡΙΖΑ ότι εγκλωβίζουν το λαό σε πλαστά και διχαστικά διλήμματα. Στόχος της πρότασης μομφής είναι να κρύψει ο ΣΥΡΙΖΑ τα αδιέξοδά του, είπε ο υπουργός Πολιτισμού, Π.Παναγιωτόπουλος.
ΣΟΚ «Μαμά πάρε με σπίτι και δεν θα ζητήσω φαγητό»

«Μαμά πάρε με σπίτι και σου υπόσχομαι ότι δεν θα σου ζητήσω ξανά φαγητό» είναι τα λόγια ενός κοριτσιού που μένει σε ένα παιδικό χωριό-οικοτροφείο στην Κάλλιθεα και...

11/08/2013 10:55:00 π.μ. | Περισσότερα >>

Πώς να καθαρίσετε τη φλοκάτη της γιαγιάς!

Τα τελευταία χρόνια οι φλοκάτες και τα λούτρινα χαλιά πέρνουν τα ηνία για την κάλυψη των δαπέδων το χειμώνα. Και, επειδή μια φλοκάτη δεν είναι και ότι πιο εύκολο...

11/08/2013 10:27:00 π.μ. | Περισσότερα >>

Χέρμαν Ρόρσαχ

Σήμερα η Google τιμά τον Ελβετό ψυχίατρο Χέρμαν Ρόρσαχ (Hermann Rorschach 1884 - 1922) Το 1884 γεννιέται ο Ελβετός ψυχίατρος Χέρμαν Ρόρσαχ, που δημιούργησε το τεστ Ρόρσαχ Το τεστ...

11/08/2013 10:18:00 π.μ. | Περισσότερα >>
**Academic example: Correct**

**recurrence relation**

**Definition/Summary**

A recurrence relation is an equation which defines each term of a sequence as a function of preceding terms.

The most well-known are those defining the Fibonacci numbers and the binomial coefficients.

An ordinary differential equation can be considered as a recurrence relation on the sequence of nth derivatives of a function (in which the 0th derivative is the function itself), and if linear can be solved using the characteristic polynomial method.

**Equations**

**Fibonacci numbers:**

Each Fibonacci number is the sum of the two preceding numbers, starting with 1 and 1:

\[ F_n = F_{n-1} + F_{n-2} \]

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89 ...

**Binomial coefficients (Pascal's triangle):**

Each binomial coefficient is the sum of the two coefficients "diagonally below", starting with 1:

\[ \binom{n}{k} = \binom{n-1}{k} + \binom{n-1}{k-1} \]

1; 1 1; 1 2 1; 1 3 3 1; 1 4 6 4 1; 1 5 10 10 5 1; ...
Correct Example: the details
(not necessary in order to apply the theorem)

Extended explanation

**Characteristic polynomial:**
This is not the same as the characteristic polynomial of a matrix or matroid.

In a linear differential equation, the derivative may be replaced by an operator, $D$, giving a polynomial equation in $D$:

$$\sum_{n=0}^{m} a_n \frac{d^n y}{dx^n} = 0 \iff \left( \sum_{n=0}^{m} a_n D^n \right) y = 0$$

Similarly, in a linear recurrence relation, the $n$th term may be replaced by an $n$th power:

$$\sum_{n=0}^{m} a_{k+n} P_{k+n} = 0 \iff \sum_{n=0}^{m} a_n x^n = 0$$

If this polynomial has distinct (different) roots $r_1, \ldots, r_m$:

$$\prod_{n=1}^{m} (D - r_n) = 0$$

or

$$\prod_{n=1}^{m} (x - r_n) = 0$$

then the general solution is a linear combination of the solutions of each of the equations:

$$(D - r_n)y = 0$$
Ιδιότητες Μετασχηματισμού Fourier

Υπάρχουν ορισμένες ιδιότητες που ικανοποιεί ο μετασχηματισμός Fourier. Οι σημαντικότερες αυτές ιδιότητες του μετασχηματισμού συνοψίζονται ως ακολούθως:

I. Γραμμικότητα: Ο μετασχηματισμός Fourier ενός γραμμικού συνδυασμού δύο ή περισσότερων σημάτων είναι ο γραμμικός συνδυασμός των αντίστοιχων μετασχηματισμών Fourier:

\[ F\left[ \alpha x(t) + \beta x_2(t) \right] = \alpha F\left[ x_1(t) \right] + \beta F\left[ x_2(t) \right] \]

II. Διαδικότητα: Εάν \( X(F) = F\left[ x(t) \right] \), τότε:

\[ F\left[ x(-F) \right] = x(t) \]

III. Χρονική μετατόπιση: Μια μετατόπιση στο πεδίο του χρόνου συνεπάγεται μια μετατόπιση φάσης στο πεδίο της συχνότητας. Εάν \( X(F) = F\left[ x(t) \right] \), τότε:

\[ F\left[ x(t-p) \right] = e^{-j2\pi F p} X(F) \]

IV. Κλιμάκωση: Μια διεύρυνση στο πεδίο του χρόνου οδηγεί σε μείωση του εύρους στο πεδίο της συχνότητας και αντίστροфа. Εάν \( X(F) = F\left[ x(t) \right] \), τότε:

\[ F\left[ \frac{1}{2} x\left( \frac{1}{2a} \right) \right] = a X\left( \frac{F}{a} \right), \quad a \neq 0 \]

V. Διαμόρφωση: Ο πολλαπλασιασμός με μικρόχρονο εκθετικό σήμα στο πεδίο του χρόνου αντιστοιχεί σε μετατόπιση συχνότητας στο πεδίο της συχνότητας. Εάν \( X(F) = F\left[ x(t) \right] \), τότε:

\[ F\left[ e^{j2\pi F t} x(t) \right] = X\left( F - F_0 \right) \]

\[ F\left[ \cos(\beta F t) x(t) \right] = \frac{1}{2} \left[ X\left( F + \frac{\beta}{2} \right) + X\left( F - \frac{\beta}{2} \right) \right] \]

VI. Διαφόρηση: Διαφόρηση στο πεδίο του χρόνου αντιστοιχεί σε πολλαπλασιασμό με \( j2\pi F \) στο πεδίο της συχνότητας. Εάν \( X(F) = F\left[ x(t) \right] \), τότε:
2b. Web usability

A site is user-friendly (usable) when: (for instance)
- It has an attractive, pleasant and clear “show case” (home page)
- The reader can navigate easily
- The pages are not too long neither boring
- The pages are not overloaded
- The fonts, colours, images are not tedious
- Too much scrolling should be avoided
- ... etc, etc.
A good example
Overloaded page example
3. Special characterics of the ODL educational material

The ODL student is based on the educational portfolio for many tasks which, in face-to-face education, would be accomplished by the educator.

Tasks like guiding the student, definition of objectives and expected results, assessment, feedback, answering FAQs, additional bibliography and sources for parallel or further study, should be included in the ODL educational material (+portfolio).
ODL text must take into account that:

- concentration span is limited;
- adult learners do not avail large continuous periods for study;
- text monotonicity should be broken using pictures, images, frames, charts etc.
ODL textbooks must be:

- easily readable, analytic and user-friendly;
- they must not leave questions or ambiguities; they must lead to the consolidation of study;
- the material must be properly organised (modular).

Moreover, ODL textbooks must contain a set of additional texts supporting the above goals —> West-Lionarakis model.
Ταξινόμηση των στοιχείων του εξ αποστάσεως εκπαιδευτικού υλικού

Πίνακας 1

Πιτρίδη Αδωνίσης 2001, σ. 48

West-Lionarakis model
Course portfolio
(readings or "parallel texts")

In higher education the single textbook practice has been abandoned; instructors today use additional bibliography (tutorials, papers, books, etc.) and multimedia resources in various formats (Lionarakis, Panagiotakopoulos & Xenos, 2005).

The additional portfolio should be polymorphic (i.e., offered in a variety of formats) so that it makes study interesting, as well as highly portable, so that learners could exploit their time while travelling, using everyday portable equipment such as tablets, mobile phones, etc.

Hence, educational material format is crucial and should maximise learning freedom and effectiveness.
ODL requirements match Web usability rules

- write short paragraphs;
- use nice colours and fonts;
- incorporate multimedia moderately;
- support search and navigation;
- avoid pages 100% full of text;
- use informal style and short sentences;
- etc.
4. The power of the Web and hypertext

plains vs hyper text:
Overview of Learning Styles

Many people recognize that each person prefers different learning styles and techniques. Learning styles group common ways that people learn. Everyone has a mix of learning styles. Some people may find that they have a dominant style of learning, with far less use of the other styles. Others may find that they use different styles in different circumstances. There is no right mix. Nor are your styles fixed. You can develop ability in less dominant styles, as well as further develop styles that you already use well.

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Using multiple learning styles and multiple intelligences for learning is a relatively new approach. This approach is one that educators have only recently started to recognize. Traditional schooling used (and continues to use) mainly linguistic and logical teaching methods. It also uses a limited range of learning and teaching techniques. Many schools still rely on classroom and book-based teaching, much repetition, and pressured exams for reinforcement and review. A result is that we often label those who use these learning styles and techniques as bright. Those who use less favored learning styles often find themselves in lower classes, with various not-so-complimentary labels and sometimes lower quality teaching. This can create positive and negative spirals that reinforce the belief that one is "smart" or "dumb".

By recognizing and understanding your own learning styles, you can use techniques better suited to you. This improves the speed and quality of your learning.

The Seven Learning Styles

- **Visual** (spatial): You prefer using pictures, images, and spatial understanding.
- **Aural** (auditory-musical): You prefer using sound and music.
- **Verbal** (linguistic): You prefer using words, both in speech and writing.
- **Physical** (kinesthetic): You prefer using your body, hands, and sense of touch.
- **Logical** (mathematical): You prefer using logic, reasoning, and systems.
- **Social** (interpersonal): You prefer to learn in groups or with other people.
5. Supporting Learning styles

<table>
<thead>
<tr>
<th>Learning style</th>
<th>Supporting new media</th>
<th>Supporting technology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Visual</td>
<td>Pictures, images, charts, videos (Multi-objects)</td>
<td>CMS, LMS, Course Builder</td>
</tr>
<tr>
<td>Auditory</td>
<td>Soundtracks, podcasts, webcasts</td>
<td>Text to speech applications, online readers</td>
</tr>
<tr>
<td>Tactile and kinesthetic</td>
<td>Videos, simulations, DIY assignments and activities</td>
<td>Online video technologies, flash, Kinect applications</td>
</tr>
<tr>
<td>Interpersonal</td>
<td>Videoconferencing, chat, wikis, Computer-Supported Collaborative Learning applications</td>
<td>Synergy, VoIP, LAMP stack, MOOCs (e.g. Coursera, edX) forums, wikis etc.</td>
</tr>
</tbody>
</table>
The Web can talk

Make your content talk!
Harness the power of ReadSpeaker text to speech to give a voice to your websites, mobile apps, digital books, e-learning materials, documents, and more!

Request a Demo

Our Solutions

- **Web Reading**
  Extend the reach of your online content by instantly creating an audio version of your website.

- **Online Document Reading**
  Make your documents accessible to more people by giving them an audio option.

- **Form Reading**
  Give your users vocal assistance when they fill out your online forms.
Adaptive Learning Environments

Web-based Adaptive Learning Environments (ALE) take into account specific characteristics of the learners such as learning style, prior knowledge, user needs and preferences, in order to personalise characteristics such as the order of presentation of learning objects, feedback, suggestions for navigation through the educational resources and user support.

For instance, to support theorists, an ALE would present theory first, whereas to support pragmatists it could start with videos or simulations demonstrating experiments and present the theory afterwards.

To implement this feature, the ALE would retrieve the ODL material structured in a modular fashion such as the West-Lionarakis model from a Database and would present it to the reader according to his/her learning style, independently of the ODL author's style.
5.4. Course Builder: a web-based tool locating OER and enriching ODL courses

In an effort to locate and exploit OER in a pedagogically correct manner, we have designed a web-based interface presenting the educational materials according to the West-Lionarakis model.

A web-based educational environment offers some important advantages such as universal use, easy transition to any place of the text as well as easy return, easy search of specific keywords or phrases, multimedia support, easy access from anywhere, portability, interoperability etc., features which are important in ODL and e-learning.
Chapter 1 Computer Networks and the Internet

1.1 "What is the Internet?"

Section Text

In this book we use the public Internet, a specific computer network (and one which probably most readers have used), as our principle vehicle for discussing computer networking protocols. But "what is the Internet?" We would like to give you a clear definition of the Internet, a definition that you can take home and share with your family and friends. Also, the Internet is very complex, both in terms of its hardware and software components, as well as the services it provides.

A Nuts and Bolts Description

Instead of giving a one-sentence definition, let’s try a more descriptive approach. There are a couple of ways to do this. One who describe the nuts and bolts of the Internet, that is, the basic hardware and software components that make up the Internet. Away is to describe the Internet in terms of a networking infrastructure that provides services to distributed applications. Let’s use some of these basic description from the Internet, which is the basic hardware and software components that make up the Internet. Away is to describe the Internet in terms of a networking infrastructure that provides services to distributed applications. Let’s use the nuts-and-bolts description from Figure 1-1 to illustrate our discussion.

An Internet’s Pieces

The public Internet is a world-wide computer network, i.e., a network that interconnects computers and devices throughout the world. Most of these computing devices are traditional desktop PCs, Unix-based workstations, and so called “servers” that store and transmit information such as WWW pages and e-mail messages. Increasingly, non-traditional devices such as mobile phones and tablets are also part of the Internet. In this book, we will focus on the public Internet, which is the network that most people use to access the Internet. However, we will also discuss some of the other networks that are used to access the Internet, such as the Internet for mobile phones and tablets.

Repository: MIT Open Courseware

1. Session 1 - Network:

- What is the Internet?
- Network Architecture: Based on TCP/IP
- Provisioning of Internet connectivity

2. Network Neutrality:

- The free encyclopedia
- Network neutrality refers to a principle that Internet service providers should not be allowed to discriminate based on the type of service that is provided. Internet neutrality is a principle that advocates against restrictions by Internet service providers or governments on the Internet.


- Cloud computing - Wikipedia, the free encyclopedia
- Network neutrality (also called neutrality, Internet neutrality) is a principle that advocates against restrictions by Internet service providers or governments on the Internet.

Image: Networking in the Internet
The Course Builder advantages:

supports automatic or manual modular course portfolio implementation;

the authors don't have to worry about format & layout but only about the content;
The medium of the future is Video
Example: Coursera (MOOCs)

Video: the dominant format
Coursera formats: Basic learning styles support

- Slides (ppt)
- Slides (pdf)
- Subtitles (text)
- Subtitles (srt)
- Video (mp4)
Neural Networks for Machine Learning

Lecture 2a
An overview of the main types of neural network architecture

Geoffrey Hinton
with
Nitish Srivastava
Kevin Swersky
Feed-forward neural networks

- These are the commonest type of neural network in practical applications.
  - The first layer is the input and the last layer is the output.
  - If there is more than one hidden layer, we call them “deep” neural networks.
Courses: distance student support
(Forums, Syllabus, tech.support, wiki, meetUp)
6. Discussion

Today a large number of free Web 2.0 technologies, platforms and applications is available.

New media and OER are widespread and available for use in ODL portfolios and can cover specific and individualised needs.

Today's students widely use ICT and social networking in many activities including learning.

ICT infrastructure enables access to MOOCs and educational resources worldwide.
Conclusion

Free LMS's & ALEs facilitate and expedite the publication of learning material.

Portable devices enable m-Learning and support mobile learners.

ICT can support the special characteristics of ODL educational material in many ways.

ICT can implement the structured delivery of ODL courses exploiting OER.

ICT can support learning styles, user needs and personalised learning to promote ODL.
### Table 2 -- Web and New Media technologies supporting ODL educational material features

<table>
<thead>
<tr>
<th>ODL material task</th>
<th>Web &amp; New Media technologies possibilities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Proper presentation of the educational portfolio</td>
<td>Special web-based platforms (e.g. Course Builder) facilitate the presentation of the educational portfolio and help authors to build an ODL course according to a specific format (such as the West-Lionarakis model)</td>
</tr>
<tr>
<td>Additional bibliography and sources for parallel or further study</td>
<td>Links to online courses, videos, simulations, etc.</td>
</tr>
<tr>
<td>Explanation of terms, keywords</td>
<td>Links to definitions in other chapters or online encyclopaedias &amp; dictionaries</td>
</tr>
<tr>
<td>Feedback</td>
<td>Playback recorded messages in educator's voice</td>
</tr>
<tr>
<td>Facilitate study, review</td>
<td>Change level of view (zoom-in, zoom-out)</td>
</tr>
<tr>
<td>Exam preparation</td>
<td>Links to online courses, OER, problem sets, exercises</td>
</tr>
</tbody>
</table>
7. Conclusion

ODL educational material for the web must be:

- user-friendly;
- modular;
- hierarchically structured;
- portable;
- reusable; and
- it must use hyperlinks and
- incorporate OER...>
... in order to:

- comply with the principles of ODL educational material;
- present the ODL portfolio in a usable and ergonomic manner;
- take into account online reader's behaviour and web usability rules;
- support mobile users, and
- support learning styles.
The Web and New Media offer new, unique possibilities to ODL learners and teachers as well.

The medium of the future is Video.

The evolution of the Web is continuous and shapes our culture! (incl. ODL)

Therefore, the author believes that the future of ODL lies on the Web.
Proposal: Academic Alliance for economic conferences in Greece [AAECG]

<table>
<thead>
<tr>
<th>ΕΓΓΡΑΦΗ - ΕΞΟΔΑ ΣΥΜΜΕΤΟΧΗΣ</th>
<th>ΕΩΣ 30/09/2011</th>
<th>ΜΕΤΑ ΤΙΣ 30/09/2011</th>
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<td>50 □</td>
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<tr>
<td>ΕΙΣΗΓΗΤΕΣ και ΜΕΛΗ ΕΔΑΕ</td>
<td>40 □</td>
<td>60 □</td>
</tr>
<tr>
<td>ΛΟΙΠΟΙ ΣΥΝΕΔΡΟΙ</td>
<td>60 □</td>
<td>80 □</td>
</tr>
</tbody>
</table>

- Κόστος συμμετοχής: 30 ευρώ
- Μέλη ΕΔΑΕ: 20 ευρώ
- Φοιτητές: 20 ευρώ
- Άνεργοι: χωρίς κόστος

[icodl.openet.gr/index.php/icodl/2013]
THE END

• Thanks for listening

• Any questions?

• More:
  t-h.wikispaces.com/oer
  t-h.wikispaces.com/web_au
  t-h.wikispaces.com/educational
  aandreatos @ gmail.com
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http://en.wikipedia.org/wiki/Massive_open_online_course
MOOCs: Top 10 Sites for Free Education With Elite Universities

What is a MOOC? =
http://www.youtube.com/watch?v=eW3gMGqcZQc

http://www.physicsforums.com/
http://t-h.wikispaces.com/web_au
http://www.learning-styles-online.com/overview/