

Quality Standards: It's All About Teaching and Learning?

Presented at NUTN, Kennebunkport, June 4, 2004

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What would make this a good talk?

- *The process answer:* if I stated objectives, used multiple media, facilitated interaction...
- *The outcomes answer:* if you stayed to the end, if you got improved test scores...

Quality Paradoxes...

- Doing the right thing does not ensure success...
(The operation was a success, but the patient died)
- Assessing for outcomes comes too late...
(Well, I'll never see *that* brain surgeon again...)
- Even if *I* think it's good, you may not...
(Especially when I want a knee operation!)

Asking the Right Questions:

- Are we evaluating the right thing?

Courses and classes? Vs people and resources...

- Is it being done at the right time?

Before? After? A paradox here...

- Did we take the right point of view?

Completion rates? Grades? Vs performance, ROI, life success...

How do you know this will be a good talk?

Because, in the past:

- People like you...
- ... expressed satisfaction...
- ... with things like this

Three dimensions of quality assessment: **the item, the user, the rating** (the product, the customer, the`satisfaction)

Our Proposal

- Describe learning resources using metadata
- Harvest metadata from various repositories
- Develop LO evaluation metadata format
- Employ evaluation results in search process

Previous Work

- Multimedia Educational Resource for Learning and Online Teaching (MERLOT) <http://www.merlot.org>
- Learning Object Review Instrument (LORI)
<http://www.qlera.net/eLera/Home/About%20%20LORI/>
- Various definitions of evaluation criteria
 - eg. DESIRE <http://www.desire.org/handbook/2-1.html>
 - Nesbit, et.al. http://www.cjlt.ca/content/vol28.3/nesbit_etal.html

MERLOT

- Peer review process
- Materials 'triaged' to presort for quality
- 14 editorial boards post reviews publicly
- Criteria (five star system):
 - Quality of Content
 - Potential Effectiveness as a Teaching-Learning Tool
 - Ease of Use

LORI

- Members browse collection of learning objects
- Review form presented, five star system, 9 criteria
- Object review is an aggregate of member reviews

The Human digestive system

Learning Object Review Instrument	Low	1	2	3	4	5	High	N/A	Comments:
1. Content Quality				★	★	★	★		
Veracity, accuracy, balanced presentation of ideas, and appropriate level of detail >> more >>									
2. Learning Goal Alignment				★	★	★	★		
Alignment among learning goals, activities, assessments, and learner characteristics >> more >>									
3. Feedback and Adaption				★	★	★	★		
Adaptive content or feedback driven by differential learner input or learner modeling >> more >>									

Issues (1)

- The peer review process in MERLOT is too slow, creating a bottleneck
- Both MERLOT and LORI are centralized, so review information is not widely available
- Both MERLOT and LORI employ a single set of criteria – but different media require different criteria

Issues (2)

- Results are a single aggregation, but different types of user have different criteria
- In order to use the system for content retrieval, the object must be evaluated

What we wanted...

- a method for determining how a learning resource will be appropriate for a certain use when it has never been seen or reviewed
- a system that collects and distributes learning resource evaluation metadata that associates quality with known properties of the resource (e.g., author, publisher, format, educational level)

Recommender Systems

- *“Collaborative filtering or recommender systems use a database about user preferences to predict additional topics or products a new user might like.”* (Breese, et.al., <http://www.research.microsoft.com/users/breese/cfalgs.html>)

- The idea is that associations are mapped between:

- User profile – properties of given users
- Resource profile – properties of the resource
- Previous evaluations of other resources

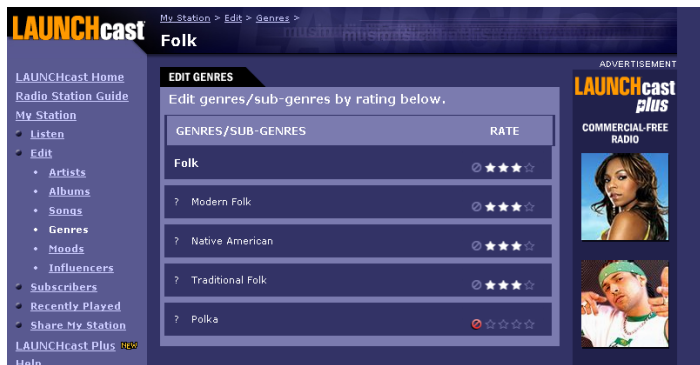
(See also <http://www.cs.umbc.edu/~ian/sigir99-rec/> and <http://www.iota.org/Winter99/recommend.html>)

Firefly

- One of the earliest recommender systems on the web
- Allowed users to create a personal profile
- In addition to community features (discuss, chat) it allowed users to evaluate music
- User profile was stored in a 'Passport'
- Bought by Microsoft, which kept 'Passport' and shut down Firefly (see <http://www.nytimes.com/library/cyber/week/062997firefly-side.html> and <http://www.nytimes.com/library/cyber/week/062997firefly.html>)

Launch.Com

- Launched by Yahoo!, allows users to listen to music and then rate selections
- Detailed personal profiling available
- Commercials make service unusable, significant product placement taints selections <http://www.launch.com>




Match.com

- Dating site
- User creates personal profile, selection criteria
- Adds ‘personality tests’ to profile

The Match.com Profile

Basics Photos **Personality** Physical



Next Step →

How creative are you? Are you shy or outgoing, whimsical or pragmatic? find out in **only 5 minutes!**

Explore your personality traits and quirks and find out what type of personality is right for you using Match.com's Ph.D.-designed Personality Test.

When you're finished, we'll send your FREE Personality Report and allow you to include highlights from it in your

Your Match.com Profile

✓	Basics	<div style="border: 2px solid #ccc; border-radius: 50%; width: 60px; height: 60px; display: flex; align-items: center; justify-content: center; margin: 0 auto;"> 25% completed </div>
	Photos	
	Personality	
	Physical	

Our Methodology

- Perform a multidimensional quality evaluation of LOs (multi criteria rating)
- Build a quality evaluation model for LOs based on their metadata or ratings
- Use model to assign a quality value to unrated LOs
- Update object's profile according to its history of use
- Identify most salient user profile parameters

Rethinking Learning Object Metadata

- Existing conceptions of metadata inadequate for our needs
 - Getting the description right
 - The problem of trust
 - Multiple descriptions
 - New types of metadata
- The concept of *resource profiles* developed to allow the use of evaluation metadata

Resource Profiles

- Multiple vocabularies (eg., for different types of object)
- Multiple authors (eg., content author, publisher, classifier, evaluator)
- Distributed metadata (i.e., files describing the same resource may be located in numerous repositories)
- Metadata models
- Analogy: personal profile

See http://www.downes.ca/files/resource_profiles.htm

Types of Metadata

First Person	Second Person	Third Person
<ul style="list-style-type: none">- Bibliographic- Technical- Rights	<ul style="list-style-type: none">- Educational- Sequence and Relational- Interaction	<ul style="list-style-type: none">- Evaluation- Classification
<i>Created by the content author or publisher</i>	<i>Created by the content user (in the process of use)</i>	<i>Created by disinterested third parties</i>

Evaluation Approach...

- Development and definition of evaluative metadata
- Expanding evaluation schema to include user types with a set of relevant ratings at different levels of detail
- Quality evaluator for the assessment of perceived subjective quality of a learning object based on criteria specific to each type of object

Our Approach

- Quality evaluator using LO type-specific evaluation criteria with rating summary or ‘report card’
 - information according to eight groups of LO users
 - weighted global rating
 - user-tailored weighting; user preferences of the evaluation quality criteria
- Combination of subjective quality values that are purposefully fuzzy

Representing Evaluation Data

- Using the schemas defined, evaluation data is stored as XML files
- These XML files are aggregated alongside learning object metadata
- Evaluation data may then be aggregated or interpreted

The User Profile

- user description data: required or available for the user to enter via sign-in forms for example:
 - user information: age, gender, occupation, education level...
 - user preferences: language, topics of interest, choice of media...
- automatically collected user data (user platform: OS, connection bandwidth ...)

LO Filtering

- Content filtering: based on content similarities (metadata-based) with other LOs (data scenario 2)
- Collaborative filtering: used when only ratings of LOs are available, no metadata (data scenario 3). It is carried out in two steps:
 - finding other users that exhibit similar rating patterns as the target user (called user neighborhood) by means of clustering algorithms
 - recommending LOs that have not been rated by target user according to their ratings by his neighborhood users

LO Quality Prediction

- Calculating object's similarity with other rated LOs based on their content metadata
- Calculating user similarity
 - clustering of the users based on their profiles (users with same preferences, competence and interests)
 - co-rated LOs (rating patterns)
- Predict quality value of the unrated LO by the target user using target user neighborhood rating of similar LOs