Social Software and the altered role of content

One of the special features of Open Content is the possibility to use content produced by other people for one's own purposes. This advantage is linked to one important requirement: *Desired content has to be found easily.*

This demand has two different major aspects: On the one hand it implies huge repositories (or referatories) storing (or linking to) a critical mass of content. There has to be a good chance that the content looked for is really there. Otherwise it is pointless to look for content in the first place. On the other hand content must be described via metadata. This does not only mean tagging subject areas, but also the conditions under which the content can be used.

From an educational perspective the lacking of an agreed taxonomy of these conditions is one of the major drawbacks why content is not as reusable as expected. Under didactical premises exists a great variety of circumstances, which require different usages of the same subject area: Is the content for kids or adults, for beginners or experts, for teaching purposes or self directed learning, for cognitive understanding or practical application, for an analytic or holistic learning style, for instructional or constructional teaching approach, etc.

The educational categories of the learning object metadata standard (LOM) (IEEE 2002) are not sound and sufficiently defined. Why are media types (like text, slide) mixed up with educational settings (such as exercise, self assessment), both within the category learning resource types? What does an interactivity level from very low to very high exactly mean? IMS Learning Design is celebrated as a standard, which is pedagogically neutral. It can describe all kinds of educational settings but it does not help to develop or find adequate educational scenarios. Until now there is no agreed upon taxonomy of these educational processes or methods, which can be linked to the LOM classification category for its intended purpose.

In our perception, this lack of an educational taxonomy has its root in a misunderstanding of the role of content. The notion of learning objects that have to be semantically closed and independent has forced the search for "neutral" content of the right size (= problem of granularity) so that it can be maximally reused for different purposes. This focus stems from an instructional point of view, where information is to be mainly transferred from teacher to learner. Consequently the main effort was put into the design und development of content that is as educationally neutral as possible.

Besides of the educational argument that this kind of content is only useful for the beginning of a learning process to provide a kind or orientation knowledge, the recent technological development of the web (especially the services related with the buzz words "Social Software" or "Web 2.0") has undermined this strategy as well. Content is not only generated by teachers for learners but is generated by learners themselves. We believe that in the long run so called "user generated content" will be the main avenue for content production. Content is created continuously by ongoing processes of communication and cooperation. Furthermore, it is especially this kind of content, which is open and shared by its very nature. It is fundamentally based on processes creating the content by the interaction of an autonomous and self-directing community of people. From a holistic educational point of view, not content but a sound and integrated learning environment of which content is just a part is king.

Towards an Educational Taxonomy

Under the above premises it is worthwhile to put great effort into the development of an educational taxonomy that is able to categorise content for its different purposes in educational settings. Preliminary work has been done in this regard by the project CampusContent[1]. A summary including our proposed nine steps towards an educational taxonomy follows hereafter.

1. Define content as Learning Objects (LOs) consisting of three different parts: One part contains the informational aspect of the content (= information object or IO), the second part is a description of the usage in educational settings or scenarios (ES) and the third part are educational objectives (EO), which define the goals of learning with the learning object. Refer to Figure 1 for a graphical representation. Develop a taxonomy for all three components, where the EO is the central part consisting of a subject goal linking to the IO taxonomy and recommendation of activities which links to the taxonomy of ESs.
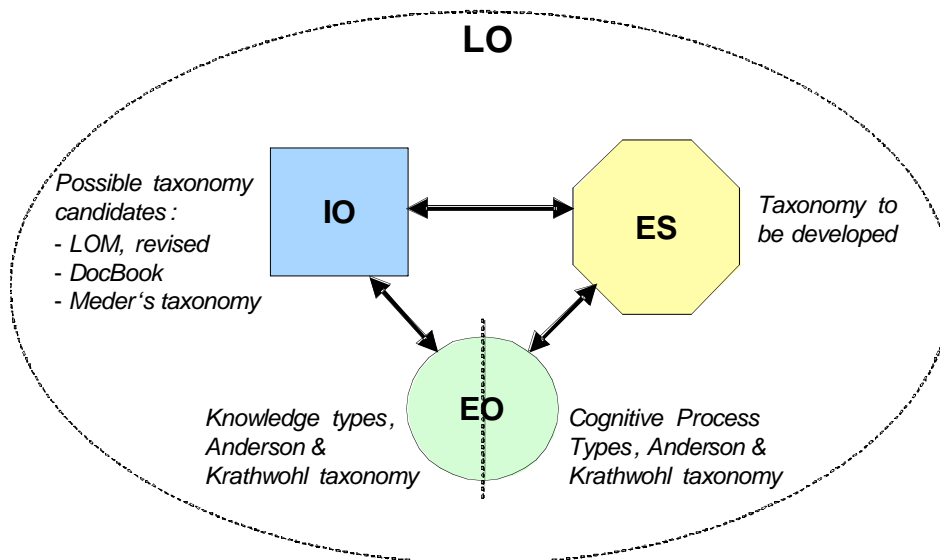
IO = Information Object   EO = Educational Objective

ES = Educational Scenario /Setting   LO = Learning Object

Figure 1: Model of a Learning Object (LO) and Potential Taxonomies for its Components.

2. EOs are structurally built by a desired dominance (= educational goal, level of competence) of a subject matter, defined by the adequate thesaurus of the area. The different topics or themes of a thesaurus can be categorised according to Anderson and Krathwohl (2001) as different knowledge *types* (refer to Table 1).

Major Types	Subtypes
Factual knowledge	Knowledge of terminology
	Knowledge of specific details and elements
Conceptual knowledge	Knowledge of classifications and categories
	Knowledge of principles and generalizations
	Knowledge of theories, models, and structures
Procedural knowledge	Knowledge of subject-specific skills and algorithms
	Knowledge of subject-specific techniques and methods
	Knowledge of criteria for determining when to use appropriate procedures
Metacognitive knowledge	Strategic knowledge
	Knowledge about cognitive tasks, including appropriate contextual and conditional knowledge
	Self-knowledge

Table 1: Knowledge Types and Subtypes (Anderson and Krathwohl 2001)

3. For the *level* of competence, Anderson and Krathwohl recommend another taxonomy consisting of six cognitive hierarchical processes, where the highest one includes all lower ones: create integrates remember, understand, apply, analyse, and evaluate. These six levels are cognitive processes, which themselves are mapped by different subprocesses (refer to Table 2).

Remember		
Retrieving relevant knowledge from long-term memory		
Recognising	Recalling	
Understand		
Determining the meaning of instructional messages, including oral, written and graphical communication		
Interpreting	Summarising	Comparing
Exemplifying	Inferring	Explaining
Apply		
Carrying out or using a procedure in a given situation		
Executing	Implementing	
Analyse		
Breaking material into its constituents parts and detecting how the parts relate to one another and to an overall structure or purpose		
Differentiating	Organising	Attributing
Evaluate		
Making judgements based on criteria and standards		
Checking	Critiquing	
Create		
Putting elements together to form a novel, coherent whole or make an original product		
Generating	Planning	Producing

Table 2: Cognitive Process Types and Subtypes (Anderson and Krathwohl 2001)

4. Educational scenarios (ESs) prescribe similar to a movie script educational scenarios. In analogy of the notion from the movie and theatre domain, educational scenarios comprise

a description of the actors and their roles, the environment (equipment and furniture) they act and their suggested activities. Educational scenarios are planned solutions for a special form of the fundamental contradiction of knowledge transfer (seen from the point of view of the teacher) and knowledge acquisition (seen from the angle of the learner). They are relatively neutral to the content – even if some of them are better suited for a certain type of content than others. Educational scenarios are equivalent to teaching techniques, methods, models and approaches but stress the character of pre- (scenario) and description (scene or setting), as can be seen in Figure 2.
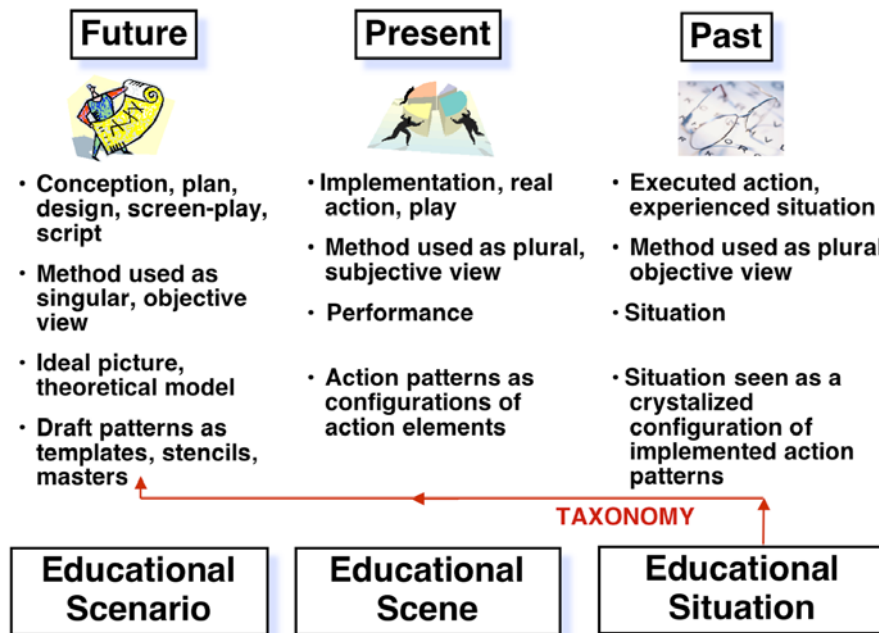

Figure 2: Educational Scenario and its Occurrences in Time.

5. According to Polanyi's general theory of ontological stratification (1962) these educational scenarios have to be conceptualised as one special stratum embedded in a hierarchy of different abstractions (levels) in the educational domain. Each layer consists of a collection of elements that have a special feature unique for this level in common. The elements of higher strata consist of special configurations of elements of the lower strata. The formation of these patterns are restricted and/or guided by special rules (maxims) based on the fundamental laws of the respective layer (cf. Hartmann 1964).
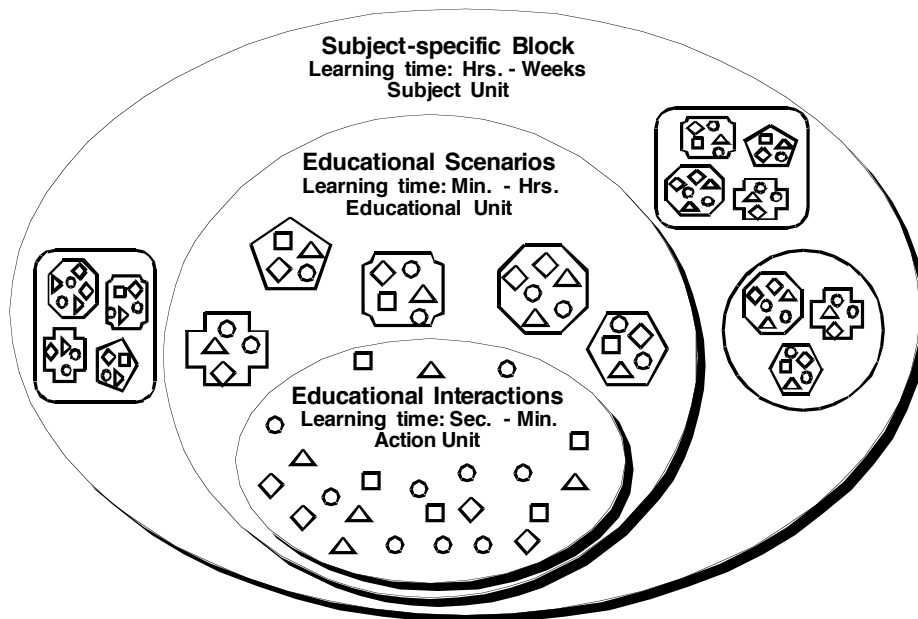

Figure 3: Strata of Didactics.

6. We distinguish 4 different levels of educational scenarios:
   a. Techniques (like a dialog in a book, theatre or movie scene): Very detailed prescription and/or description of activity patterns within a social, physical and chronological structure. Examples are Brainstorming, Flashlight, "Ball-Bearing" discussion, web safari.
   b. Methods (like a book, theatre or movie scene): Detailed prescription teaching patterns and/or description of learning patterns to be adapted to different social, physical and chronological structures. They form the core level of educational scenarios respectively scenes and are more abstract than Techniques as they do not require a special social, physical and chronological setting. Examples are Task, Exercise, Exploration, Disputation, Inquiry etc.
   c. Episode (like a book chapter, theatre act or movie sequence): Loose prescription of Teaching Models and/or description of Learning Arrangements consisting of a sequence of different teaching or learning patterns. Examples are Case Study, Apprenticeship, Simulation, Project, Workshop etc.
   d. Ensemble (like a book, theatre or movie genre): General principles underlying the construction process of educational scenarios. It results in some kind of teaching and learning mode. It provides a certain orientation (focus, alignment, bias) for the teaching and learning process by determining the preferred and educational scenarios. Examples are ex-cathedra teaching, distance education, project based learning, inquiry based learning.
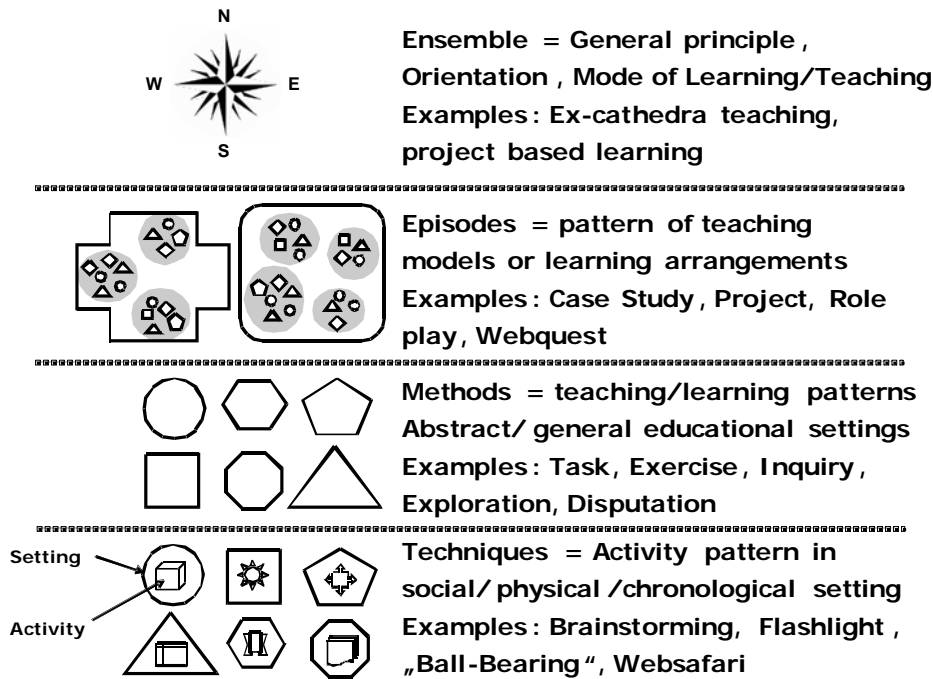
Figure 4: The Four Different Levels of Educational Scenarios.

Ensemble = General principle, Orientation, Mode of Learning/Teaching
Examples: Ex-cathedra teaching, project based learning

Episodes = pattern of teaching models or learning arrangements
Examples: Case Study, Project, Role play, Webquest

Methods = teaching/learning patterns Abstract/general educational settings
Examples: Task, Exercise, Inquiry, Exploration, Disputation

Techniques = Activity pattern in social/physical/chronological setting
Examples: Brainstorming, Flashlight, „Ball-Bearing", Websafari

7. Each educational scenario at level b (Methods) is in reality a family of patterns as they can be implemented in a variety of different situations. Their concrete setting depends on a specific configuration of a fundamental set of educational categories or dimensions. Examples of educational dimensions are: number of learners, degree of authenticity of the learning task, type of the learning organisation, or type of the teacher's role. Special functions with respect to e-learning have the different parameter values of the educational dimension of body awareness. It works as a discriminator between face-to-face (f2f) and different degrees of face-to-interface (f2i) teaching or learning. Each educational dimension has different parameter values.
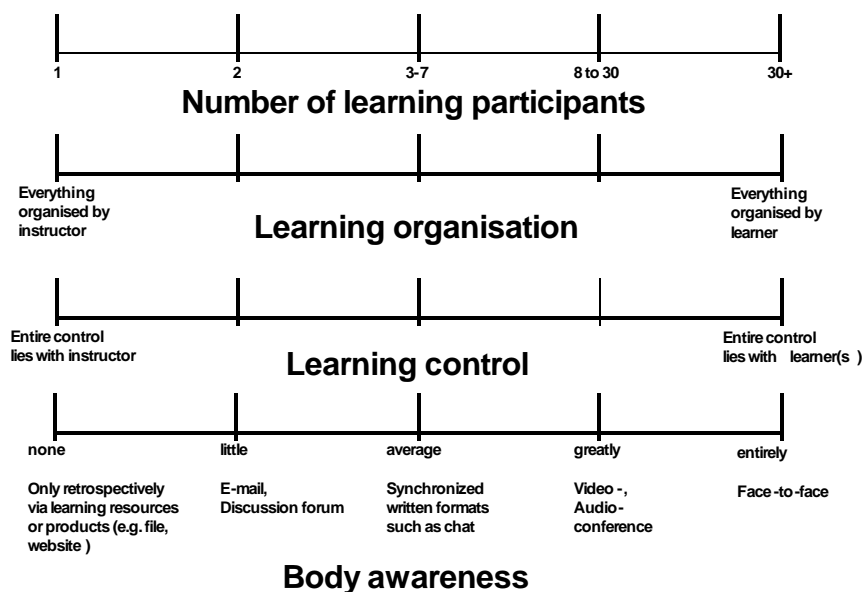

Figure 5: Sample Educational Dimensions including Sample Parameter Values.

8. A certain configuration of parameter values of these educational dimensions results in an educational profile. Not every pattern of parameter values creates a reasonable and meaningful setting within the educational context.
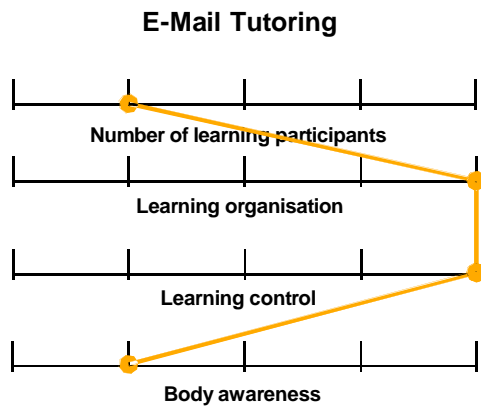
E-Mail Tutoring

Number of learning participants

Learning organisation

Learning control

Body awareness

Self-Study with Learning Software

Number of learning participants

Learning organisation

Learning control

Body awareness

Figure 6: Sample Educational Profile for E-Mail Tutoring.
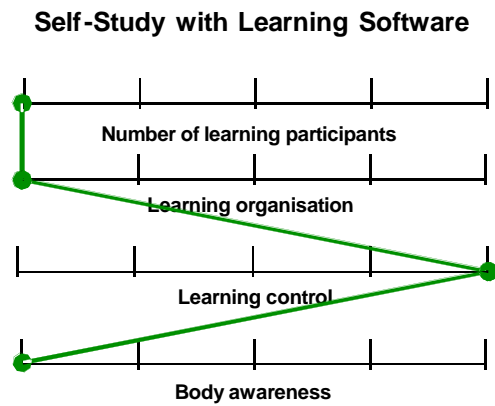
Figure 7: Sample Educational Profile for Self-Study with Learning Software.

9. The educational categories are abstracted from a graphically represented model formed by fundamental educational relations. This model is a reification of the current state of educational research. It must incorporate a minimum set of educational categories but be sufficient to describe every possible educational setting.
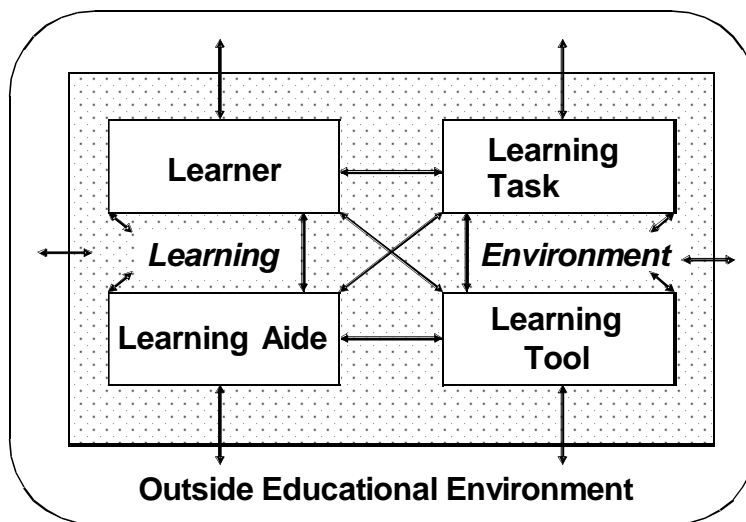
Learner

Learning Task

Learning

Environment

Learning Aide

Learning Tool

Outside Educational Environment

Figure 8: Fundamental Educational Model by Peter Baumgartner.

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