ARE E-LEARNING STANDARDS NEUTRAL?

Bernard Blandin (bblandin@cesi.fr)
CESI, département CESI-ONLINE
297, rue de Vaugirard
75015 PARIS – France

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Abstract
This paper is an attempt to analyse the current standardization process from a sociological standpoint. The author raises questions about what can be standardized when social or cultural facts and practices are concerned, and the legitimacy of such a process, when the consensus on social and cultural issues is achieved within a small technical group.

GENERAL

A standard is "a document, established by consensus, that provides, for common and repeated use, rules, guidelines or characteristics for activities or their results, aimed at the achievement of the optimum degree of order in a given context" (ISO/IEC, 1996). Consensus, in that context, is defined as a "general agreement, characterised by the absence of sustained opposition to substantial issues by any important part of the concerned interests and by a process that involves seeking to take into account the views of all parties concerned and to reconcile any conflicting arguments. (ISO/IEC, 1996)".

These definitions raise several questions: who establish the consensus, and when the “concerned interests” can be considered as legitimate? To whom the “optimum degree of order” is imposed? To those having established the consensus, or to a wider range of stakeholders? If the “optimum degree of order” is imposed to a wider range of stakeholders, is it acceptable by them, and who measures the acceptability of it?

Standardization process requires consensus between experts representing the designers of the object or of the process and the main stakeholders, in order to guarantee to the users that the result achieved by the use of the product or by the implementation of the process are “optimum”. But, when standardizing Information Technologies for Learning, Education and Training as in ISO/IEC JTC1-SC36, is such a technical consensus enough?

A PROGRESSIVE DERIVATION

When the aviation industry decided they needed technical specifications for the CBT products they were using (1988), these specifications intended to describe basic technical requirements: type of computer, type of media, type of man-machine interface, etc. Nine years later, the academic members of EDUCAUSE felt more concerned with the description of learning units and of the “learner information” when they launch the IMS project.

Parallel initiatives were launched by IEEE and by the American Government, fostering the creation of the Advanced Distributed Learning consortium (ADL). The Comité européen de normalisation also launched the same year (1997) its Information Society Standardization System (CEN-ISSS). During two years (1997-1999), lot of work was done to produce convergent specifications, among which the ADL-SCORM, which embedded the previous work done by IMS and by the European consortium ARIADNE. The resulting set of specifications provided a basis for the launch of the ISO/IEC standardization process at the end of 1999. Created the same year, the CEN-ISSS workshop dedicated to the Learning Technologies
standards introduced another set of specifications based on the “Qualifications Transparency” work in the standardization process. The result is that the objects dealt with currently are far from the original AICC technical specifications, as shown below (Table 1).

<table>
<thead>
<tr>
<th>DOMAIN</th>
<th>AICC</th>
<th>IMS</th>
<th>IEEE</th>
<th>CEN-ISSS WS-LT</th>
<th>ISO/IEC JTC1 SC36</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hardware</td>
<td>X</td>
<td></td>
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<td></td>
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<tr>
<td>Platforms Interoperability</td>
<td>X</td>
<td>X</td>
<td>X</td>
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<tr>
<td>Medias</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Man - Machine Interface</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Description of Learning Units</td>
<td>X</td>
<td>X</td>
<td>LOM</td>
<td>EML</td>
<td>LRM</td>
</tr>
<tr>
<td>System Architecture</td>
<td></td>
<td></td>
<td>LTSA</td>
<td>LET Env.</td>
<td></td>
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<tr>
<td>Collaborative Technologies</td>
<td></td>
<td>X</td>
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<tr>
<td>Vocabulary</td>
<td></td>
<td>X</td>
<td>X</td>
<td>LIP</td>
<td>PAPI</td>
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<tr>
<td>Participant Information</td>
<td></td>
<td>LIP</td>
<td>PAPI</td>
<td>LIP</td>
<td>LIP / PAPI</td>
</tr>
<tr>
<td>Description of Competences</td>
<td>RCD</td>
<td>PAPI</td>
<td>RCD</td>
<td>RCD / PAPI</td>
<td></td>
</tr>
<tr>
<td>Intellectual Property</td>
<td>X</td>
<td></td>
<td>X</td>
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<td>Quality</td>
<td></td>
<td>X</td>
<td>X</td>
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</tbody>
</table>

Table 1 (Acronyms in the table means that drafts were discussed)

Another point is that “metadata”, a kind of language with semantic objects and syntactic rules, invented in 1995 in Dublin (Ohio), allow not only to specify attributes for technical objects, but also to represent quite any type of object or of process using the object, and therefore to create digital models of this object and of the processes which can be applied to it, or in which the object is involved, as well as the processes which can be applied to the representations of the object. Objects which can be represented in such models could be of any kind, including objects produced by social or cultural practices, or objects resulting from cultural or social conventions: pedagogical relationship and competences were among the objects that the IMS project intended to model.

The objects modelled and handled in the current standardization process are representations of the real world which often have their own regime of legitimacy: processing a person identifier, in Europe, is regulated by law; vocabularies can include terms which are also defined by law or which has a specific meaning in some professional context; qualification standards are in some countries defined by social partners or by sectors... With the standardization of digital representations and of their processing as “data”, it is possible to step out of the field in which technical standardization procedures are legitimate, and the experts can endorse prerogatives which are normally those of the legislator or of social partners. Such was the case with the “Unique Human Identifier”, contested by some countries and finally withdrawn at the plenary meeting held in Adelaide (Australia).

THEORIES AND REPRESENTATIONS OF THE LEARNING PROCESS

A brief reminding of how “Learning Theories” are classified is needed to understand how representations of the learning process reveals the theory – or the “paradigm” behind it, because many papers on the uses of IT in education or on designing learning situations using IT discuss categories of learning theories, generally with the perspective of situating themselves within the proposed classification. Very often, they oppose two categories, an old-fashioned theory and a recent one: objectivism versus constructivism (Jonassen, 1994), instruction or “instructionism” versus learning or constructivism (Brown & Duguid, 1992), behaviourism versus constructivism (Depover & al., 1998). Some authors use a typology rooted in the history of thought with more categories: Aristotelianism, Behaviourism and Constructivism (Giordan, 1998), empiricist (behaviourist), rationalist (cognitivist & constructivist), pragmatist – sociohistoric (situationalist)
(Koper, 2001). But most of them do not account for all theories. This is why I prefer a typology based upon the implicit theories of mind underlying the theories of learning (mind as a separate substance versus embodied mind), and upon the focus of the theory of learning itself (content versus process): this allows to identify four metaphors of the learning process (Blandin, 2003), as follows (table 2).

<table>
<thead>
<tr>
<th>Process-oriented</th>
<th>Embodied mind</th>
<th>Mind as a separate substance</th>
</tr>
</thead>
<tbody>
<tr>
<td>Learning is building</td>
<td>Cognitivism, Constructivism, Situationalist</td>
<td>Learning is remembering</td>
</tr>
<tr>
<td>Active Pedagogy</td>
<td>Interrogative Pedagogy</td>
<td></td>
</tr>
<tr>
<td>Content-oriented</td>
<td>Learning is training</td>
<td>Behaviourism</td>
</tr>
<tr>
<td>“Mastery Learning”</td>
<td>Aristotelianism, Objectivism, Instructionism</td>
<td>Expositive Pedagogy</td>
</tr>
</tbody>
</table>

These categories which classify all learning theories, also identify “cultures of learning” associated with each metaphor, which have different social representations of the learning process (Blandin, 2003). Each of them is also associated with a “social worlds” (Blandin, 2002), in which pedagogical stances, vocabularies, roles, values, etc. are different.

**Learning objects and the representation of the learning process**

Many authors have discussed the issue of neutrality of a “Learning Object” model: Koper argues that the learning object model does not provide, by itself, “sufficient means to build complete, flexible and valid units of study to be delivered through learning management systems” (2001, 5). Learning objects “are not typed to their usage in the context of a unit of study” (d°). Because “the learning object model expresses a common overall structure of objects within the context of a unit of study, but does not provide a model to express the semantic relationship between the different types of objects in the context of use in an educational setting. As a result, the learning object model fails to provide for a model of the structure of the content of the different objects” (d°). The key point, for Koper, is that a learning environment must be considered as a social system in which learning activity is central – not objects – and cannot be correctly described if the interactions between people and objects playing a part in the situation are not represented. Kraan and Wilson (2002) quote a father of SCORM saying “SCORM has nothing in it about collaboration”, because it “is essentially about a single learner, self-paced and self-directed”. Similarly, the LOM (IEEE 1484.12.1-2002) do not cover all learning situations, for the reasons presented by Koper (2001). And if we carefully analyse the values given in Value Space (VL) for some items, the LOM also appear to be culturally marked. For example:

- **5.1 Interactivity Type: VL = {active, expositive, mixed}.** What about “interrogative” or “behaviourist” types of interactivity, this later being the core of CBT systems since the Plato System (Dooijes, no date)? Behaviourism seems to be implicitly banned, and interrogative has no place. Is it because it implies man-to-man interactivity and not man-machine interactivity?
- **5.5 Intended End User Role: VL = {teacher, learner, author, manager}.** These values correspond to the roles in the “Instructionism” paradigm. Tutor, mentor or coach, do not appear in the list. Is it because they do not exist in such paradigm?

It seems to me that the LOM are rooted in a vision of educational paradigms which simply opposes “Instructionism” and “Constructivism”, and try to be neutral regarding these two. They leave apart other learning paradigms, thus they appear to be biased and to have chosen to encompass a certain type of controversy, excluding others. In that sense, they are not neutral.
May be this is preferable, if we follow Friesen: “specifications and applications that are truly pedagogically neutral cannot also be pedagogically relevant” (2003, 5).

**LTSA and the representation of the learning process**

The LTSA standard (IEEE P1484.1) claims to be “pedagogically neutral, content neutral, culturally neutral, implementation neutral and platform neutral” (p 8). This might be true, but only within a paradigm where learning appears as a knowledge transferring process, also known as “Instruction”. LTSA is represented in Figure 1.

![Figure 1: the LTSA system components](image)

To me, there is a learning process model underlying the current state of LTSA, and this model is clearly described in Annex B, and in particular in section 9.2 (p. 35):

"The learner has new or different knowledge after a learning experience. In information technology, this is diagrammed as one subsystem (environment) transferring information to another subsystem (the learner), i.e., an interaction."

This assertion is supported by a diagram, which is reproduced as Figure 2 below. The Layer 1 diagram is the one which shows the representation of the “interactions” as conceived by the collective author of this structure. In spite of the precautions taken in note, saying: “this description is not a diagram of any theory of learning”, the representation of the flows in Layer 1 as well as in Layer 3 between the learner entity and the environment are one-way flows: the environment provides stimuli to the learner entity, which responds by a new behaviour or by a change in behaviour. This is also clearly indicated for Layer 3 in section 5, and in particular in 5.2 (p. 16) and in 5.5 (p17):

**Learner entity inputs / outputs:**
- "(Input) The learner entity process may receive a multimedia presentation via the multimedia dataflow."
- "(Output) The learner’s behavior may be observed and emitted via the behavior dataflow."

**Evaluation inputs / outputs:**
- "(Input) the learner entity’s observable behavior via the behavior data flow."

![Figure 2: the different layers. LTSA implements layer 3](image)
The terms used ("behavior", "input", "output") as well as the systemic model with one-way flows ("the learner entity [...] may receive...") are clearly from behaviourist inspiration. They read as "a multimedia stimulus sent by the delivery process generates an observable behavioural response from the learner entity".

It has also been established that open system models with inputs / outputs are not a relevant description of living beings processes: life starts with self-organised, operationally closed systems (Varela, 1980). LTSA claims not to be a description of any living being process, but simply intends "... to simplify certain engineering aspects of technology design: the focus is on the overall view of information flow..." (9.2.1, p. 35). This simplification means that only some operations of the learner entity subsystem are taken into account: those and only those which are responses to the stimuli provided by the delivery subsystem (5.4, p. 17):

<table>
<thead>
<tr>
<th>Behavior Information Type</th>
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<tr>
<td>&quot;Behavior information, via the behavior dataflow, may include keyboard clicks, mouse clicks, voice response, choices, written responses, etc.&quot;</td>
</tr>
</tbody>
</table>

Implicitly, the only behaviour which appears meaningful according to the model, and which can, therefore, be taken into account by the evaluation subsystem, is a reaction to a stimulus provided by the delivery system. To make sense within the LTSA, any action from the learner entity either has to be related to an identified stimulus to which it responds or cannot be taken into account. Again, implicitly the Stimulus-Response model comes to the surface. This is the weakest point of this model: intentional actions from the learner entity, as simple as creating a document, cannot be represented! Such a situation cannot be implemented using the LTSA model as an abstraction. If the learner becomes a resource producer (Jonassen, 1994), some information flows are actually missing: flows between the Learning Entity and the Delivery subsystem should be two-ways, the learner should be able to control in some way Learning Resources, etc. The current LTSA model seems to allow any type of implementation of what Jonassen (1994) calls the "instructional process", but there are learning technology systems using technology as cognitive tools that cannot be represented at all.

PROVISIONAL CONCLUSIONS

Though documents produced during the standardization process explicitly refer to a “culturally neutral, context neutral” policy, I have demonstrated that they embed peculiar representations of the domain modelled. These representations, proposed by the initiator of a “New Work Item”, appear then to remain along the whole process as the framework for getting consensus between experts. The process of “mapping” models and representations provided later on onto the first schema to provoke consensus favours such a thing. The Annex C “Illustrations of Stakeholder Mappings”, which constitutes the most important part of the LTSA standard (47 pages out of 120), is a good example of such practices: any stakeholder should find a response to his/her objections by an appropriate mapping, even if this mapping leads to keep unstructured many potential configurations of the learning process, like communities of learning and learner to learner communication: “Team Learning” is simply considered as a particular configuration within the single “learner entity”, and thus, its representation needs no change in the diagram (p 74)!

This also raises a question: is this “mapping process”, used to represent data within existing data structures which do not exactly fit with them, legitimate when it applies to representations of social activities, such as learning, communicating, etc.? It seems, that, doing so reveals a confusion between the map and the territory, between representations and the world which is represented. To avoid such traps, it is very important that the models and the vocabularies proposed be validated by experts from the domain and by representatives of all stakeholders, and
in particular, the administrations in charge of education and vocational training, in order to make sure that the standards in progress take into account relevant practices and representations. Any representation of a social process should first get a wide social consensus, not only a consensus between some experts interested in participating for various reasons.

When the process of standardization deals with domains such as the description of competences, training paths, educational systems, vocational training systems, quality of educational or training systems… which are the fields at the core of the current standardization process, it is important to find the right level of representativity of the participating experts, who should be mandated by all stakeholders on clear objectives.

REFERENCES


KRAAN, W. & S. Wilson (2002). Dan Rehak: "SCORM is not for everyone.". Retrieved 21/11/03 from http://www.cetis.ac.uk/content/20021002000737