



Objectives

The first FAD courses were bound to the reference platform and it was not possible to interchange platforms and training plans. This caused the rising of the need to define certain standards to resolve the problem. The unit faces in detail the scenario and the more widespread solutions (AICC and SCORM standard).

Although e-learning got off to a shaky start in the late 1990s, industry analysts are now bullish about the enabling technologies, notably enterprise learning management systems (LMSs), both in terms of growing adoption rates and quick return on investment (ROI).

as FAD courses usage grows there are features and capabilities that become increasingly important [1]

By the end of the unit you will have learned what the standards demand and what are the requirements to which a course must comply.

METHODOLOGICAL STANDARDS

The adoption of standards and specifications facilitates the dominance of platform independent, open technologies and promotes user-centric e-learning systems. Standardized technologies have several merits that protect and nurture an e-learning investment. These are in general:

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Interoperability: Content from multiple providers can be easily disseminated within consumers and a multitude of systems. Problems of translation, communication, information exchange are easily solved and transparent interaction of systems is achieved.
- 
Re-usability: Content and code can be assembled, disassembled, and re-used quickly and easily. Additionally content objects can be adapted and used in a context other than that originally designed.
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Manageability: Systems can track the appropriate information about the learner and the content. Learners' profiles, educational target and content "speak the same language" so it is easier to find, manage and assembly "the right stuff" for each case.
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Accessibility: A learner can access the appropriate content at the appropriate time on the appropriate device. Content warehouses can be developed and become available to amateurs or professionals that use any application based on the common standards.
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Durability: Content is produced once and transplanted many times in different platforms and systems with minimum effort. Buyers are not "trapped" by a particular vendor's proprietary learning technology and their investments become permanent and adverse to risk.
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Scalability: Learning technologies can be expanded in functionality in order to serve broader populations and organizational purposes. An organization's return on

investment in e-Learning products can increase if they can be leveraged beyond their original scope.

The standardization of procedures in e-learning can be achieved through the co-operation of all participants of the e-learning community: developers, vendors and users should work together in order to create, validate, establish and disseminate standards for every e-learning task[2].

Today, the more widespread E- learning standards are

- ④ SCORM–Sharable Component Object Resource Model.
- ④ AIC –Aviation Industry CBT Committe

Why are standards used;

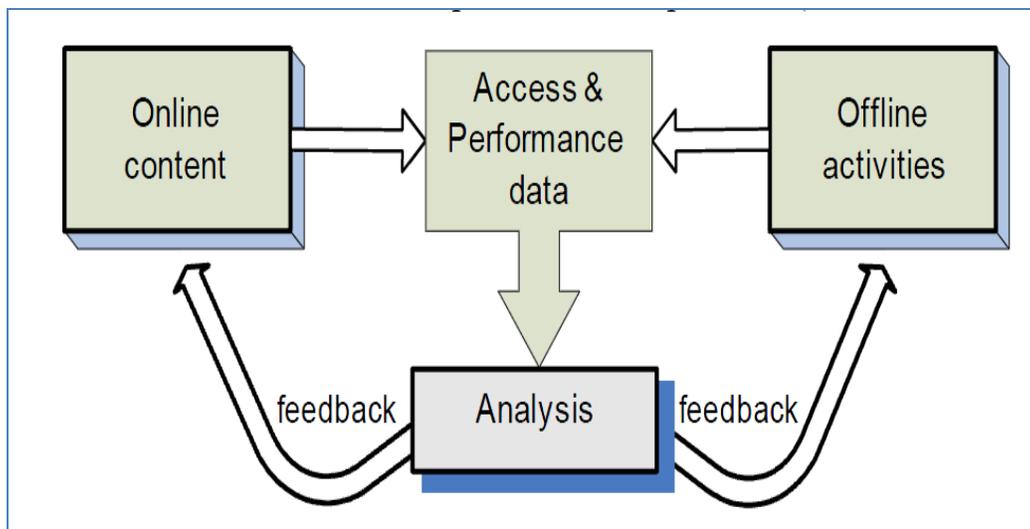
It is generally accepted that National and international committees, consortia and many organizations have been developing standards and specifications for e-learning technologies the last twenty years.

The truth is that not only would the development and use of international standards in e-learning] produce a direct cost savings, but the information technology systems could be used in a wider range of applications, and used more efficiently. Better, more efficient and interoperable systems, content, and components will produce better learning,education, and training which actually has a positive effect upon all societies. [3]

AICC

AICC (<http://www.aicc.org/>) is an organization that has developed a set of specifications for:

- a) the online content - the structure of lessons, and tests and the progression logic philosophy for the whole instructional material of a course,
 - b) the offline instructional activities - training statistics, student assignments, student access data, etc, c) access and performance data – of students at all levels of courseware presentation
- The student interaction with the online content and the performance in offline activities is a valuable piece of information that must be stored, analyzed and used as feedback for appropriately delivering the course (both offline and online).



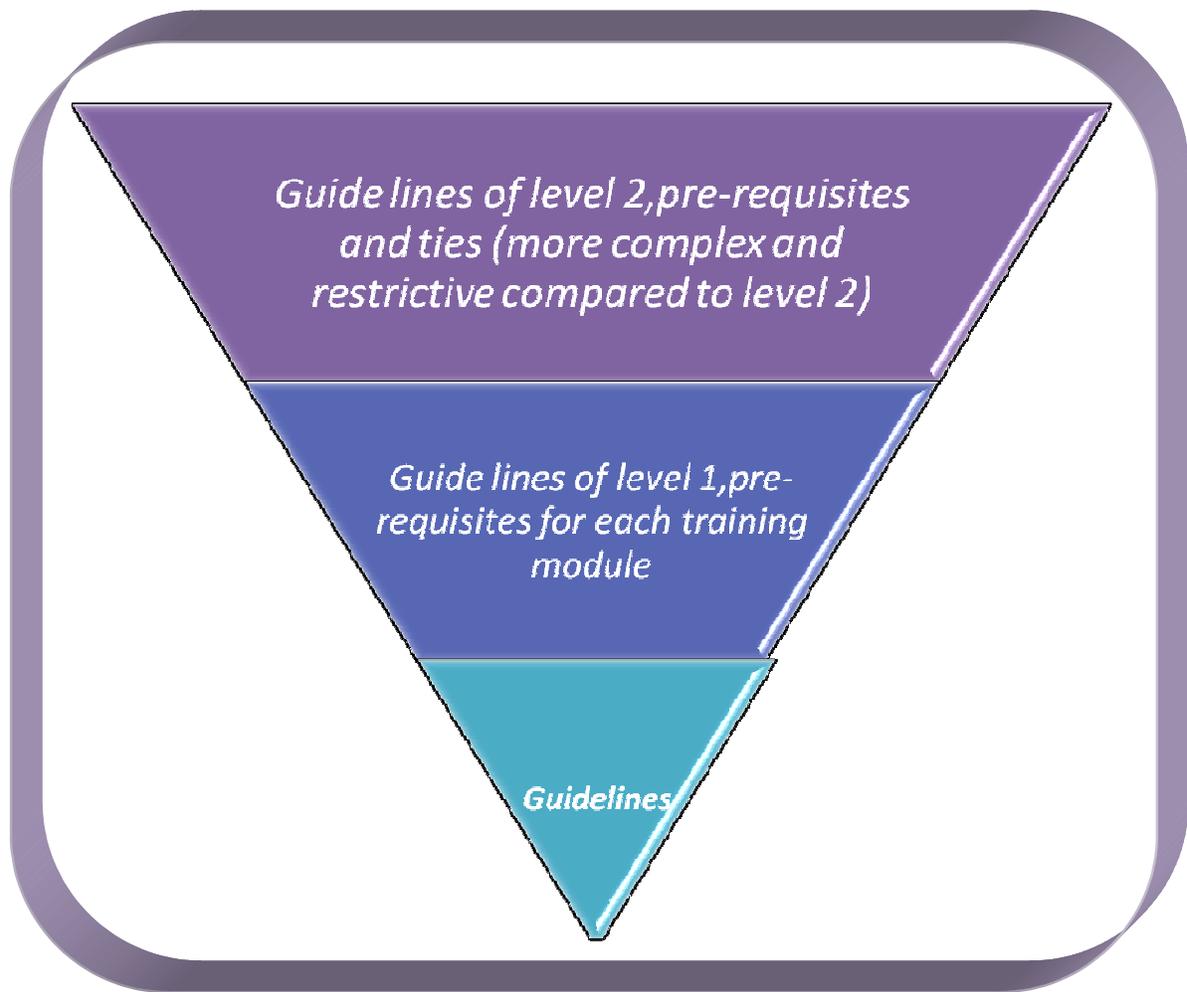
AICC specifications and their interactions

The more prominent points for e-learning are:

1. **Guide lines for the course fruition.** The course structure is envisaged as being presented to the student allowing him to learn the content and objectives to reach, so as to simplify course fruition.
2. **Level of fruition of the user.** Given that distance learning is centred on the user, this requires creating supports that help him to monitor one's own level of learning and the stage it is found in respects to the training track. We assume the visualisation of the fruition times of the didactic units for the control by the learner and the use of the intermediate verification tests that provide a result of easy reading for the student.
3. **Study and assessment of the results.** At the end of one or more verifications an evaluation mechanism is required.
4. **Defining the pre-requisites for delivering the course.** It is required that entry tests are set up for assessing the level of knowledge of the topics by the students, before facing the didactic unit.
5. **Access binds.** The standard calls for inserting access binds to those didactic units for which propedeutic modules are necessary, so as to solicit the learner and teacher in advance to face all the modules considered preparatory or introductory to the different units.

Compared to what is reported above, the AICC standard is articulated into three progressive levels that each one contains the points detailed above in restricting progress.

- ① **level 1:** the following are present: guide lines, but no binds or pre-requisites are required
- ② **level 2:** the following are present: guide lines of level 1 , pre-requisites for each training module relative binds for the completion of certain modules to access others
- ③ **level 3:** the following are present: guide lines of level 2, pre-requisites and ties (more complex and restrictive compared to level 2). The objectives are specified within the associated training modules – through some rules defined a priori – to other modules, for links of information for the purpose of defining the superceding of interdisciplinary units within the didactic track.



AICC standard progressive levels diagram

Scorm

SCORM is the acronym for Sharable Courseware Objects Model

The SCORM model was born in 1997 upon initiative of the Department of Defense of the United States, within the ambit of the ADL project (Advanced Distributed Learning), to plan a strategy in the use of new technologies in e-learning. This specification has been developed so that the training material of the government could be interoperable. SCORM is a set of rules, defining very small fragments of e-learning, that can be combined to form complete courses. The SCORM model allows in this way to use over and over again the same didactic microunits, optimising access, managing and consulting of the e-learning courses content.

In short, SCORM is a set of specifications for developing, packaging and delivering high-quality education and training content/materials whenever and wherever they are needed. SCORM compliance leverages course development investments by ensuring that compliant courses are "RAID":

-  **Reusable:** Easily modified and used by different development tools and platforms.

-  **Accessible:** Can be searched and made available as needed by both learners and content developers.

-  **Interoperable:** Operate across a wide variety of hardware, operating systems and web browsers.

-  **Durable:** Do not require significant modifications with new versions of system software [4]

Fundamental objectives of the SCORM standard are the easy portability of learning content from one Learning Management System (LMS) to another as well as the

reusability of learning objects. The easy portability of WBTs creates an additional benefit for vendors of learning content and LMSs because the high costs for portation are reduced. WBTs can exchange data with the LMS via standardized interfaces. Above all, the metadata model of the LOM standard integrated in the SCORM supports the retrieval of learning objects in varying constellations. SCORM denominates the smallest unit which can be administered by an LMS as a Sharable

Content Object (SCO). A Sharable Content Object (SCO) represents one or more assets which use the SCORM runtime environment to communicate with different LMSs.

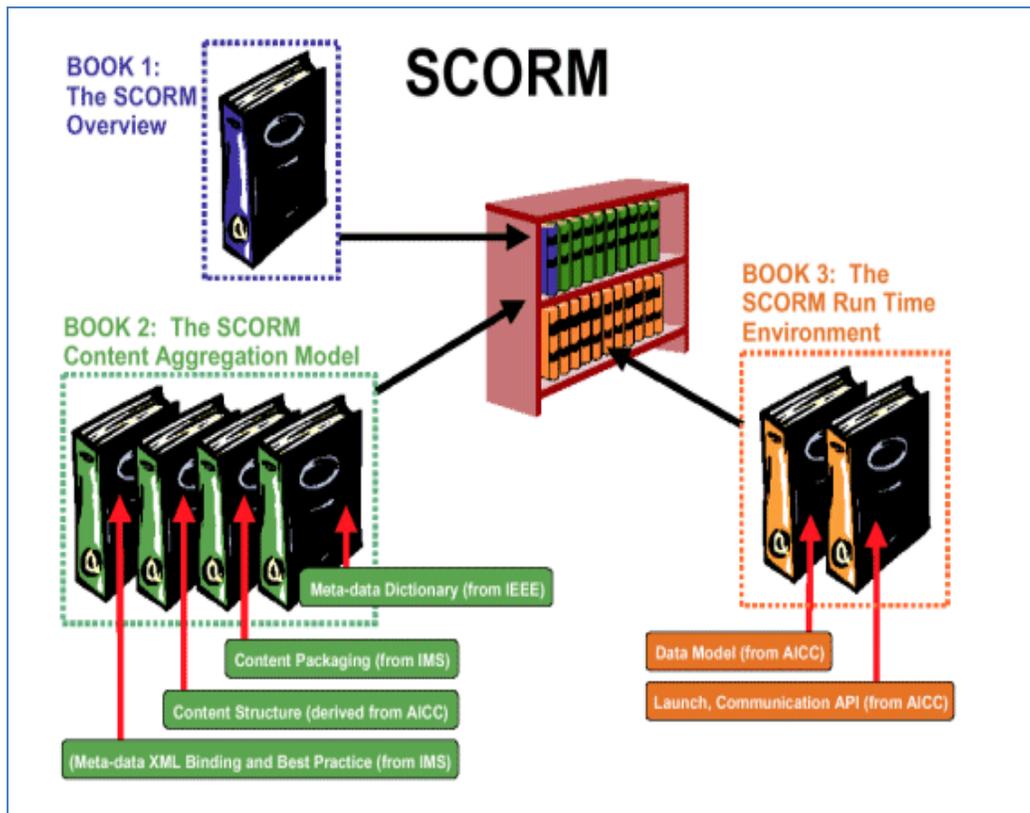
An SCO represents the lowest level of content granularity which can be tracked by an LMS. An SCO should be independent of learning context to be reusable in different

learning situations. Moreover, several SCOs can be assembled to form learning or exercise units on a super ordinate level. To make a potential reuse practicable, SCOs should be small units. They can be the basis for sharable content repositories which facilitate their

exchange. Only an LMS may launch an SCO, an SCO must not launch other SCOs. [5]

SCORM contains two specifications: the Content Aggregation model and the Run-Time Environment. The Content Aggregation model specifies how individual learning content is described and how a sharable and interoperable course is composed from the content. The Run-Time Environment specifies an Application Programming Interface (API) and data model for course packages to interface with the LMS.

One of the main purpose of SCORM is to facilitate digital course contents being transferred among different Content Management Systems, CMS(or Learning Management Systems, LMS). In order to do this, instructional designers need to make learning content into modular objects that can be reused in other programs, and to enable any CMS to reference others for usable learning content. Following is the "official" illustration diagram of SCORM models:



Scorm Structure

References

[1] Assessing Learning Management Systems John Hall

[2] **The Present and Future of Standards for E-Learning Technologies**

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[3] ISO, 2002

[4] Research on Advanced Distributed Learning by Using SCORM

[5] **IEE Computer Society The Sharable Content Object Reference Model (SCORM) – A Critical Review** Oliver Bohl, Dr. Jörg Schellhase, Ruth Sengler, Prof. Dr. Udo Winand
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[6] www.vsscorm.net