Interoperability Standards for MicroLearning

Teacher-Learner Interaction
mediated by technology:

Interoperability
Learner/Teacher interaction is facilitated by an LMS, but can be used in different LMSs.

AICC
An industry standard, proprietary (not open-source). Features four parts:
- Learner Management System (LMS)
- Content (LMSC, LOMC, LOMQ)
- Learning Object Metadata (LOM)
- Learning Management System (LMS)

SCORM
Industrial packaging of XAPI data. Based on the specification for communication with LMS through SRS/SCP.

Improved Standards
- Common Cartridge (Carricade) for content sharing, open-source, non-proprietary.
- IMS Content Metadata (LCMI) for content management, open-source, non-proprietary.
- LTI provides a standard for point-to-point integration of tools.
- SCORM provides a standard for content integration.
- xAPI (fka Tincan) provides a standard for data exchange.

Requirements of MicroLearning
- Learning content is broken down into small units.
- A large number of courses links to be supported.
- Meta data association.
- Need for easy reformatting of content.
- Print-friendly content support.

Advantages
- Well supported by most LMSs.
- Both AICC and SCORM use CMI data model.

Shortcomings
- Security problem in SCORM through JavaScript.
- Limited scalability and distributability of learning content.

Relevance of Interoperability Standards
- Developers need a basis for software development.
- instructional design needs a basis for authoring tools.
- However, LMS needs to support these standards.

Recommendation for MicroLearning
- Developers should ensure compatibility with relevant interoperability standards.
  - SCORM, xAPI, LTI, QTI.
Interoperability Standards for MicroLearning
Google Trends:

Mobile Learning:
Ubiquitous Learning:

MicroTeaching:
MicroLearning: Edmodo

https://www.edmodo.com/
Teacher-Learner Interaction mediated by technology:

LMS
Learning Management System

LO
Learning Object
- Student identification
- Learning history
- Launch
- Assessment
- Resumption
- Dismissal
- Student timing
- Student results (tests, assignments)
- Student identification
- Learning history
- Launch
- Suspension
- Resumption
- Dismissal
- Student timing.
- Student results (tests, assignments)
Teacher-Learner Interaction mediated by technology:
Interoperability

Learning Objects (LOs) are not bound to an LMS, but can be used in different LMSs.

Necessary: course content and structure descriptors.

Syntactic interoperability: through HTML and JavaScript.
Semantic interoperability: through standards.

Older interoperability standards:
AICC (since 1993)
SCORM (since 2000), using XML
Alphabet Soup

AICC  Aviation Industry Computer-Based Training Committee
CMI  Computer Managed Instructions
CC  Common Cartridge
LTI  Learning Tools Interoperability
QTI  Question Test Interoperability
SCORM  Sharable Content Object Reference Model
SCO  Sharable Content Object
SIF  Schools Interoperability Framework
SIS  Student Information Systems
AICC


SCORM

Content packaging in XML files.
Runtime specification for communication with LMS through JavaScript.
Sequencing of course navigation in XML file.

imsmanifest.xml contains the tree structure of the SCOs.
The SCORM Generalised Model

diagram showing the relationships between various services and components of the SCORM framework, such as sequencing service, delivery service, local content repository, remote content repositories, and SCORM content packages.

from: IMS Abstract Framework,
AICC
First interoperability standard.
Originally file-based, then web-based.
JavaScript runtime interface.
Allows distributed course content.

CRS file: general course information.
AU file: lessons.
DES file: course elements.
CST file: course structure.

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Improved Standards

- Common Cartridge: larger focus on blended learning, more inclusion of instructor.
- xAPI (TinCan): takes SCORM further and improves scalability and interaction from the student.
- LTI: provides a standard for 3rd party plugins.
- QTI: provides standardised representation of questions and tests.
- SIS: provides capability for institutional exchange.
Requirements of MicroLearning

- Learning content to be broken down in small segments.
- Large number of content bits to be supported.
- Many user interactions.
- Non-linear sequencing of content.
- Mobile device support.
Common Cartridge Application

Sources
- Publisher Repositories
- ECMS
- Client File systems
- Server File Systems
- eLib
- Dynamic Packaging
- Services

Server
- Supported Content
  - Discussion Forums (with seed topics)
  - Question Test
  - Interoperability (Assessments & Question Banks)
  - Basic LTI (links to remote services)

Client
- Supported Content
  - HTML/DHTML
  - Javascript
  - Java Applets*
  - Flash (SWF)*
  - Rich Media*

* Common Cartridge provides a way for packages to identify any third party components required to execute its content
A SIF Zone is a logical grouping of applications, in which each application has an Agent that communicates with other Agents through the Zone Integration Server (ZIS).

The ZIS handles all security information and routes all messages.

A SIF Zone is platform independent and vendor neutral meaning that all data can be shared dynamically.
LTI Architecture
Comparison SCORM - xAPI

SCORM:
- Requires constant internet connection
- Content must be housed in an LMS
- Tracks fail/pass, post-test score, completion
- Tracks formal eLearning courses

xAPI:
- Session-less communication
- Content can exist anywhere
- Tracks wide variety of learner experiences
- Can track informal, self-guided learning
Relevance of Interoperability Standards

Details are only important for software developers.

But learning content developers need to use authoring tools which support these newest standards.

Also, LMS needs to support those standards.
Recommendation for MicroLearning

Developers should ensure compatibility with newest Interoperability standards:

CC, xAPI, LTI, QTI.
Thank you for your attention!

Questions?